Fink, D. (2003). Creating significant learning experiences: An integrated approach to designing college courses. San Francisco: Jossey-Bass. (Chapters 3& 4)

CHAPTER THREE

DESIGNING SIGNIFICANT LEARNING EXPERIENCES I: GETTING STARTED

The first two chapters of this book have presented two key ideas: all teaching should strive to create significant learning experiences, and it is useful to have a taxonomy—a language and set of concepts—for identifying what constitutes such experiences. If one accepts the associated premise that higher education is and ought to be moving toward a learning-centered approach, then the question arises, How can teachers do a better job of creating significant learning experiences for students?

The answers to this question obviously have several important components, but it is clear that if professors want to create courses in which students have significant learning experiences, they must learn how to *design that quality into their courses.* Unless a course is designed properly, all the other components of effective teaching will have only limited impact.

This chapter and the following one will present ideas on how to design courses that will generate powerful learning experiences for students and fulfill those deep dreams that faculty have for their teaching (as described in Chapter One). The present chapter will lay out some general ideas about designing courses, introduce a new model of the course design process, and then walk readers through the first three steps of the process. Chapter Four will examine the remaining steps, in which the classroom events that actually shape the learning experience are created.

Two Basic Ways of Putting a Course Together

When professors face the task of putting together a course, they use one of two distinct approaches. The first, which I call the "list of topics" approach, is especially widespread among new professors who have had no training for this task, but it is also common among experienced professors. Here's how it works: The teacher looks at the subject, creates a list of eight to twelve topics on it, and then proceeds to work up lectures on each topic. With the addition of a midterm exam or two plus a final, the course is ready to go. The list of topics may come from the teacher's own understanding of the subject or from the table of contents of a good textbook. In extreme cases, teachers use the "two textbook" version of this process: they select one text for the students to read, usually one that is easy to grasp, and a second, more sophisticated text as a resource for their own lectures. In my own early days of teaching a course on world regional geography, for example, my course design—if I can call it that—consisted of nothing more than laying out the sequence of regions (following the order provided by the text) and adding a few exams. In a matter of minutes, I had the course design finished.

The attractive feature of this approach is that it is extremely quick and easy to do. Creating the week-to-week outline of topics rarely takes more than thirty to forty-five minutes. The downside, on the other hand, is that it focuses on the organization of the information and pays little or no attention to how that information will be learned, and therefore typically supports only the learning of foundational knowledge. Unfortunately, as research indicates, this kind of learning by itself has a relatively short half life and, more significantly, does not meet the educational needs of students and society today.

The alternative to this traditional, subject-centered approach is to take a learning-centered approach and put the course together systematically, in a process I call "integrated course design." In this approach, the teacher takes responsibility for deciding what would constitute high-quality learning in a given situation and then designing that quality into the course and into the learning experience. What would this approach look like? That is the subject of this and the following chapter.

Integrated Course Design: A New Model

There is a sizable body of literature on the subject of instructional design, most of which is aimed at public school teachers. But some notable books do focus on higher education (Diamond, 1998; Bergquist, Gould, and Greenberg, 1981).

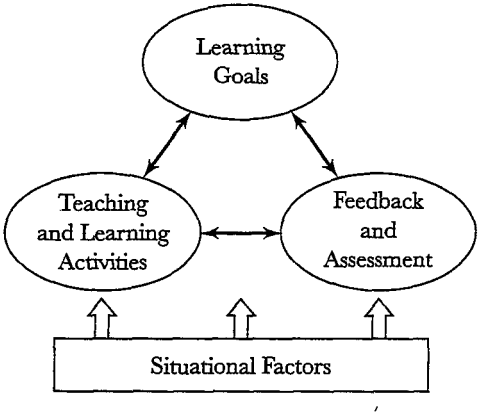
In each of these models, the design process includes a number of common elements—identify the educational goals and objectives and then look at the learning activities, resources, assessment, and so on—but the models differ in how they lay out the various steps, which steps they break into separate parts and which they lump together, and similar matters.

The model of integrated course design that I will introduce here has some of these same characteristics. It includes the same key components but lays them out in a distinctive fashion. The key difference is that it is a relational model, not a linear model—hence the term *integrated.* In addition, this particular formulation of the design process has a number of attractive features. It is

- *Simple:* It is relatively easy for teachers to remember the basic model.
- *Holistic:* It unpacks and reveals the complexity that exists in effective course design.
- *Practical:* It identifies what one needs to do in the course design process.
- *Integrative:* It shows the interactive relationships among the key components of a course.
- *Normative:* It provides specific criteria for determining whether a given course design is good or not.

The basic features of integrated course design are shown in Figure 3.1. The box at the bottom ("Situational Factors") refers to information that needs to be gathered; the three circles refer to decisions that need to be made. The arrows coming up from the box indicate that this information should be used in the process of

FIGURE 3.1. KEY COMPONENTS OF INTEGRATED COURSE DESIGN.



making the three key sets of decisions. The arrows connecting the three circles indicate that the components need to be connected to and support each other.

This basic outline leads to a series of key questions that need to be answered when designing any learning experience:

1. What are the important *situational factors* in a particular course and learning situation?
2. What should our full set of *learning goals* be?
3. What kinds of *feedback and assessment* should we provide?
4. What kinds of *teaching and learning activities* will suffice, in terms of achieving the full set of learning goals we set?
5. Are all the components *connected and integrated,* that is, are they consistent with and supportive of each other?

Backward Design

Careful readers may note that in the sequence of questions, the one on "feedback and assessment" comes before the one on "teaching and learning activities." For many people, this is counterintuitive. However, after many years of working with professors on designing and redesigning their courses, I have noticed that if we deal with feedback and assessment first, it greatly enhances our ability to identify what teaching and learning activities are needed.

Grant Wiggins (1998) has given this sequence the wonderfully descriptive label of *backward design.* As implied by the label, the designer starts the process by imagining a time when the course is over, say one or two years later, and then asking: "What is it I hope that students will have learned, that will still be there and have value, several years after the course is over?" The answer to this question forms the basis of the learning goals. Then the designer moves backward in time to the end of the course and asks the feedback and assessment question: "What would the students have to do to convince me that they had achieved those learning goals?" The process of working out the answer to that question clarifies the real meaning of the learning goals. And then it's time to move back in time once more, to the time of the course itself, and ask: "What would the students need to do *during* the course to be able to do well on these assessment activities?"

One can successfully design a course either way, by doing the teaching and learning activities first or the feedback and assessment activities first. But experience suggests that backward design, that is, doing the feedback and assessment first, greatly clarifies and facilitates answers to the question of what the teaching and learning activities need to be. Hence this is the sequence that I will present here.

A Key Feature: Integrated Components

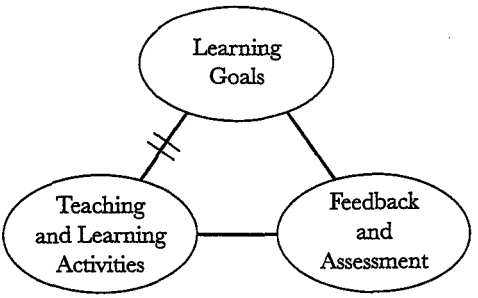
One very important feature of this model of course design is the proposition that the three initial decisions need to be integrated: the learning goals, the teaching and learning activities, and the feedback and assessment must all reflect and support each other. To illustrate how critically important this is, let me describe a hypothetical course that lacks integration.

Imagine yourself talking to a professor who is teaching a very bad course, one that violates all the known principles of good teaching. He has come to you asking for help in analyzing the course and figuring out what needs to be changed. First, you ask the professor what he wants students to get out of the course. His response: "I want to cover all the important content in world regional geography." After pointing out that "covering the content" is what the teacher does, not what the students do, you repeat your request for a statement about *learning* goals. So he converts his statement to a learning goal: "I want the students to master all the important information and ideas about the different world regions." So you note that one of his learning goals is for students to fully understand and remember important content. But you press a bit more with this question: "Is there not anything else you would like students to learn in this course?" After some reflection, he replies, "Well, it would probably be nice if they could also learn how to think critically about world geography." Now he has a learning goal that is a bit more significant: critical thinking. You could press for more significant learning goals, but you have two you can work with—foundational knowledge and a critical thinking version of application learning.

Now you turn to the question of the teaching and learning activities used in the course and find that the course is a straight lecture course: fifteen weeks of lectures, interrupted only long enough to administer a midterm and final exam. Each week the teacher lectures on a new region and has students read the relevant chapter on that region. Here is the first problem: a disconnect or lack of integration between the learning goals and the teaching and learning activities. Assuming for the moment that the teacher is effective as a lecturer, that he has a good textbook, and that the students are good note-takers and readers, there is a moderate possibility that they will succeed in learning the content. But they are getting no practice and feedback that will support learning how to think critically about the subject. In terms of our basic diagram of the course design process, this means the course has the disconnect shown in Figure 3.2 between the learning goals and the teaching and learning activities.

But the problem gets worse. When it comes time to create the midterm (or final) exam, this professor has a problem: What kinds of questions should he write

FIGURE 3.2. COURSE INTEGRATION PROBLEM.



for the exams? He can write content-related questions, and—with a little luck—the students may do acceptably well on these questions. But the dilemma he faces is whether to include questions that call for students to engage in critical thinking about world geography problems. If he does include thinking questions, the exam will accurately reflect his learning goals, but the students will probably do poorly because the teaching and learning activities did not give the students any practice in critical thinking. In terms of the course design model, this means there is now a second disconnect in the course, between the teaching and learning activities and the feedback and assessment activities, as shown in Figure 3.3.

On the other hand, the professor could opt *not* to include thinking questions on the exams because he knows that including them would not be fair, given the way he taught the course. In this case, the assessment would properly reflect the teaching and learning activities but would not be supportive of the learning goals. Again, this solution produces a disconnect in the course, but now it is in a different part of the model, as shown in Figure 3.4.

Notice the dilemma this teacher faces: No matter what he does with the exam, two of the three needed connections in the course are broken. And this points to a key relationship that is true with all courses. Any teacher who breaks one of the three connections will inevitably have to break a second connection! This means that two out of three important connections will be broken. And a course with two broken connections is a broken course. It will not work and cannot work effectively because it is not integrated. This is why it is so important for any course design to make sure that all three components are integrated, that is, that they reflect and support each other.

FIGURE 3.3. SOLUTION #1: MATCH ASSESSMENT WITH GOALS.

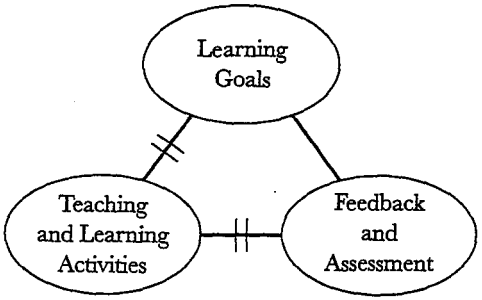
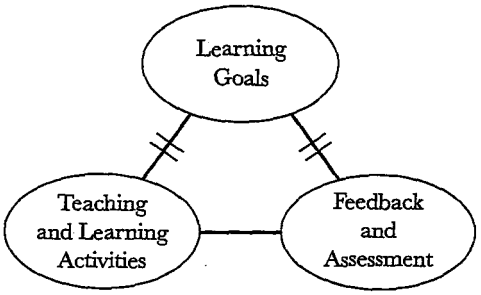


FIGURE 3.4. SOLUTION #2: MATCH ASSESSMENT WITH LEARNING ACTIVITIES.



Getting Started with Designing a Course

This model for designing a course includes three phases, each of which involves a number of substeps, as shown in Exhibit 3.1 (and as elaborated somewhat more fully in Appendix A). The remainder of this chapter will describe how this process gets started and will include comments on the first three steps of the initial phase. Chapter Four will address the remaining steps, these shape the activities that students will actually experience, plus the other two phases of the process.

It is my own belief that this process works best if teachers work on each step one at a time and in this sequence. This is important because each step forms the

EXHIBIT 3.1. THE TWELVE STEPS OF INTEGRATED COURSE DESIGN.

If professors want to create courses in which students have significant learning experiences, they need to design that quality into their courses. How do they do that? By following the twelve steps of the instructional design process, as laid out here.

Initial Phase: BUILD STRONG PRIMARY COMPONENTS.

1. Identify important *situational factors.*
2. Identify important *learning goals.*
3. Formulate appropriate *feedback and assessment procedures.*
4. Select effective *teaching and learning activities.*
5. Make sure the primary components are *integrated.*

Intermediate Phase: ASSEMBLE THE COMPONENTS INTO A COHERENT WHOLE.

6. Create a thematic *structure for the course.*
7. Select or create a *teaching strategy.*
8. Integrate the course structure and the instructional strategy to create an *overall scheme of learning activities.*

Final Phase: FINISH IMPORTANT REMAINING TASKS.

9. Develop the *grading system.*
10. Debug the *possible problems.*
11. Write the course *syllabus.*
12. Plan an *evaluation* of the course and of your teaching.

basis for subsequent steps, that is, they build on each other. Therefore it is important to finish the early steps and do them properly before one attempts to complete the later steps.

Initial Phase: Build Strong Primary Components

The initial phase of the design process calls for the teacher to build strong primary components—the learning goals, feedback and assessment measures, and teaching and learning activities shown earlier in Figure 3.1. These components must be built properly because they form the basis for the rest of the design process. And this initial phase begins by examining various situational factors and determining which of them may be significant in a particular course.

Step #1: Identify Important Situational Factors

When designing a new course or redesigning an old one, the first step needs to be a careful review of situational factors that may affect the three key decisions. If you skip over this step or do a superficial job, you increase the chances of ending up with a course that doesn't work for the students involved, doesn't meet the needs of the curriculum, doesn't fit the teacher, or otherwise misses the mark. Hence it is important to take the time necessary to carefully review a number of potentially important factors and determine which of them need to be kept in mind during the rest of the design process.

Steps in Integrated Course Design

Initial Phase: Building Components Parts
1. **Situational Factors**
2. Learning Goals
3. Feedback & Assessment
4. Teaching & Learning Activities
5. Integrate the Component Parts

Intermediate Phase: Coherent Whole
6. Course Structure
7. Teaching Strategy
8. Overall Set of Learning Activities

Final Phase: Four Remaining Tasks
9. Grading System
10. Possible Problems
11. Write Syllabus
12. Evaluation of Course and Teaching

Drawing from the literature on instructional design and my own experience in working with faculty, I have put together the checklist of potentially significant factors in Exhibit 3.2. I have tried to make the list as comprehensive as possible by including questions about the specific context, the general context, the subject matter, and the characteristics of the learner and of the teacher.

The assumption is that for any given course, some of these factors will be important and others will not be. But if you systematically go through the whole list, you should be able to identify all the major factors for any particular course.

Specific Context. This set of questions is always important. Knowing whether there are twenty students or a hundred, whether the course is a freshman introductory course or a graduate seminar, whether the class meets M-W-F for fifty minutes or once a week for three hours, whether the course is going to be conducted live in a classroom or delivered totally online—such information will always be important when making key course design decisions.

Expectations of External Groups. Groups external to the course frequently have expectations about what students should learn, and the teacher needs to take these expectations into account. For example, *society* wants graduates of college courses in U.S. government and U.S. history to have a basic knowledge of this aspect of our country and perhaps a commitment to the ideals and activities of civic-minded citizens in a democracy. Hence those courses need to give consideration to

EXHIBIT 3.2. IMPORTANT SITUATIONAL FACTORS.

Specific Context of the Teaching and Learning Situation

- How many students are in the class?
- Is the course lower division, upper division, or graduate level?
- How long and frequent are the class meetings?
- How will the course be delivered: via live classroom instruction, interactive TV, as an online course, or some combination?

Expectations of External Groups

- What does society at large need and expect, in terms of the education of these students, in general or with regard to this particular subject?
- Does the state or related professional societies have professional accreditation requirements that affect the goals of this learning experience?
- What curricular goals does the institution or department have that affect this course or program?

Nature of the Subject

- Is this subject matter convergent (working toward a single right answer) or divergent (working toward multiple, equally valid interpretations)?
- Is this subject primarily cognitive, or does it include the learning of significant physical skills as well?
- Is this field of study relatively stable, in a period of rapid change, or in a situation where competing paradigms are challenging each other?

Characteristics of the Learners

- What is the life situation of the students at the moment: full-time student, part-time working student, family responsibilities, work responsibilities, and the like?
- What life or professional goals do they have that relate to this learning experience?
- What are their reasons for enrolling?
- What prior experiences, knowledge, skills, and attitudes do the students have regarding the *subject*?
- What are the students' *learning styles*?

Characteristics of the Teacher

- What prior experiences, knowledge, skills, and attitudes does this teacher have in terms of the *subject* of this course?
- Has the teacher taught this subject before, or is this the first time?
- Will this teacher teach this course again in the future, or is this the last time?
- Does the teacher have a high level of competence and confidence in this subject, or is this on the margins of the teacher's zone of competence?
- What prior experiences, knowledge, skills, and attitudes does this teacher have in terms of the *process of teaching*? (That is, how much does this teacher know about effective teaching?)

Special Pedagogical Challenge

- What is the special situation in this course that challenges the students and the teacher in the desire to make this a meaningful and important learning experience?

those learning goals. Sometimes the *college or university* wants particular courses to contribute to the institution's writing-across-the-curriculum agenda. Sometimes *departments* have courses designated to attract majors (if they want more majors) or, at other times, to separate the wheat from the chaff (if they want to limit the number of majors). In other instances *professional societies* have licensing exams, and the department designates certain courses to prepare students for these exams (or for specific parts of the exams).

Nature of the Subject. There are significant differences in the nature of different subjects taught in higher education, and these differences need to be reflected in the course design. Some courses deal with subject matter that is primarily theoretical; the general purpose here is for students to understand the differences between various theories and the implications of these differences. Other courses deal with subject matter that is very practical in nature, meaning the direct goal is for students to learn how to do something.

Another important difference among courses concerns whether the subject is convergent or divergent. Many science, mathematics, and engineering courses are *convergent* in that the intellectual effort is aimed at problems that have a single correct answer. Other courses, especially in the humanities and sometimes in the social sciences, are more *divergent,* meaning the goal is often to search for multiple interpretations of a given phenomenon or to understand multiple perspectives on a problem. These characteristics need to be reflected in the way the course is designed.

And one other feature is sometimes characteristic of a subject. At times a given discipline undergoes a major change in the way research is done or in its reigning paradigm. At such times, there may be controversy within the discipline about the relative merit or value of old and new paradigms. When I was in graduate school, for example, the discipline of geography was debating the proper place of quantitative analysis. When there are changes or controversies such as this within a field of study, some of the courses in a department's curriculum need to inform students about this situation and assist them in developing a thoughtful response of their own to the issues involved.

Characteristics of the Learners. Every educational situation has a set of students involved, and these students differ from course to course and even from student to student within a given course. Different students bring different life or professional goals, even to the same course. They are in different working or family situations. A teacher would need to plan differently for a class that consists primarily of single nineteen-year-olds living on campus than for a class with a high percentage of students who are parents, perhaps married, twenty-five to forty years old, and working full or part time.

In addition to demographic differences, students also bring different feelings, relevant experiences, and prior knowledge to different courses. Students often bring a high level of fear or anxiety to courses on some subjects, such as math or statistics. In other courses, they may come with anticipation or excitement. For example, in my region of the country, a course titled "Geography of Sports" will always create enthusiastic interest.

This is also the place in the design process to consider the topic of students' varied learning styles. Some learners prefer visual ways of learning, others verbal or kinesthetic or a combination. Students also vary in the level of education, maturity, or sophistication they bring with them. Some are ready to engage in "deep learning" while others are only accustomed to superficial learning.

With the growing interest in online and distance education, teachers and researchers are discovering that some kinds of students work well in this mode but others don't. This information can be used to advise students on whether to take an online course, but it can also be used in the course design to decide how much student support needs to be built in.

If teachers know or can gather information about the characteristics of the students likely to sign up, this can be very helpful in making decisions about how their courses will and should operate.

Characteristics of the Teacher. Although it may seem obvious, it is easy to forget about the other party always present in an educational event: the teacher (or, in some cases, a set of teachers). It is important to take time to review your own characteristics when designing your courses.

While college teachers are generally competent in their discipline, there are times when people teach courses that are on the edge of their area of expertise. This may affect not only the time required to generate problems and exercises but also the level of risk they are ready to take when choosing a teaching strategy.

It is also wise to honestly assess your current level of teaching skills. That is, how developed are your interaction skills with students, your course management skills, your course design skills, and so on? If your realistic assessment is that these are still fairly basic, you may want to keep the course design close to your comfort zone. If your teaching skills are well developed, you can feel free to take on more challenging goals and more powerful teaching strategies.

Related to teaching skills, but one step more fundamental, is the philosophy of teaching, that is, the teacher's underlying values and beliefs. We all have tacit beliefs about how learning really occurs and our own values concerning what constitutes good learning and good teaching. On a long-term basis, these are variables that it's useful to examine and revise. But in the short term, when designing a given course, it's essential to take them as given and shape the course design decisions accordingly.

At the most fundamental level, we all have a particular attitude toward our subject and our students. How much do we care about our students, really? To what degree and in what ways do we perceive our subject to be exciting and important? I have met teachers who did and did not in fact care about their students, individually or collectively, and teachers who did and did not see their subject as interesting. All these personal factors need to be taken into account in the course design process.

The Special Pedagogical Challenge. After a teacher has reviewed each of these situational factors and decided which are relevant to a given course, I often find it useful to pose a concluding question as a way of integrating and focusing this information: "What is the special pedagogical challenge of this course?" That is, what is the special situation in this course that challenges both students and teacher to make this a meaningful and important learning experience? If the teacher can find a way to successfully meet that challenge, the chances of the course being a success for the students are high. Let me give some examples to illustrate different kinds of challenges.

One outstanding teacher of statistics on my campus sees the specific pedagogical challenge of his course as students' fear of statistics. Students, in his view, often see statistics as a complex, mysterious process that "only the gods can understand." If he can find a way to demystify this perception of statistics and get students to see this subject as just a systematic way of doing the same kind of calculations that they all do every day, then he has an excellent chance to move them along to a more sophisticated level of understanding and ability to use statistics.

In contrast, teachers in psychology sometimes say their special pedagogical challenge as just the opposite. Students often come into their courses believing that psychology is just everyday common sense, and therefore they "already know all this stuff." The challenge in this case is to get students to see that there are some unexpected phenomena out there, that theories, experiments, and research give us insights that are contrary to many popular beliefs, and that we therefore need to study others and ourselves carefully to really understand why people do what they do.

One of the more surprising responses to this question came from a teacher of modern German history. When asked what the special pedagogical challenge of that course was, she thought awhile and finally said, "Hitler." Her explanation was that today's students have been so filled with stories of World War II, the Holocaust, and the rise and fall of Hitler and the Nazis, that they think that is the whole focus of all German history. So her special challenge is to help students see that that as only one chapter, a dreadful chapter to be sure, but only one aspect of German history, and that there are other aspects that are equally important and fascinating, and as positive as Hitler was negative.

A Resource for Analyzing Situational Factors. Anyone who wants additional ideas and examples on how to collect information about important situational factors would do well to read chapter 6 of Robert Diamond's book on designing courses (1998, pp. 59–78). Diamond believes that a careful analysis of these factors is extremely important to any design and describes the thorough processes he has used in his work with course and curriculum design at Syracuse University and elsewhere. His examples show how to collect information with survey questionnaires and achievement tests as well as with informal discussions to clarify situations where assumptions tend to fly in the face of real understanding, and how to use this information to identify specific needs and desired outcomes for the course or curriculum at hand.

Summary of the First Step. The key point to remember about this first step in the course design process is that it is important to do a careful, in-depth job of collecting and analyzing information about various situational factors. Skipping this step or doing a cursory job will result in bad decisions later on. On the other hand, a thorough, in-depth analysis here positions one to see important needs and contextual factors and will often even suggest answers to the design questions that need to be considered next—important learning goals, meaningful forms of feedback and assessment, and appropriate teaching and learning activities.

Step #2: Formulate Significant Learning Goals

Steps in Integrated Course Design

Initial Phase: Building Components Parts
1. Situational Factors
2. **Learning Goals**
3. Feedback & Assessment
4. Teaching & Learning Activities
5. Integrate the Component Parts

Intermediate Phase: Coherent Whole
6. Course Structure
7. Teaching Strategy
8. Overall Set of Learning Activities

Final Phase: Four Remaining Tasks
9. Grading System
10. Possible Problems
11. Write Syllabus
12. Evaluation of Course and Teaching

The natural inclination of most faculty, given their training and disciplinary socialization, is to take a content-centered approach to learning goals. That is, they say, in one way or another: "I want students to learn about (or to master) topics X, Y, and Z." This is an understandable response, but it is not the best place to use one's content expertise. That will come later, when it comes to creating a structure for the course and setting up learning activities within that structure. But creating a list of topics won't give you what you need to create more significant learning experiences for students.

Instead of making a list of topics, use a learning-centered approach and identify what students should get out of the course. This is where the taxonomy of significant learning

described in Chapter Two will be of value. This taxonomy, in essence, suggests that any course has the potential to support multiple kinds of significant learning:

- *Foundational knowledge:* knowledge about the phenomena associated with the subject and the conceptual ideas associated with those phenomena
- *Application:* an ability to use and think about the new knowledge in multiple ways, as well as the opportunity to develop important skills
- *Integration:* the ability to connect one body of knowledge with other ideas and bodies of knowledge
- *Human dimension:* discovering how to interact more effectively with oneself and with others
- *Caring:* the development of new interests, feelings, and values
- *Learning how to learn:* developing the knowledge, skills, and strategies for continuing one's learning after the course is over

If you can use this taxonomy (or any other formulation of significant kinds of learning) to describe what you want students to learn in your course, then and only then will you be able to select the kinds of teaching and learning activities and the feedback and assessment activities needed to support this kind of learning.

Formulating Significant Learning Goals. The basic procedure for formulating learning goals is to ask a series of questions about each kind of learning that is potentially relevant. Using the taxonomy of significant learning, this would involve asking what each kind of learning would mean in the context of the specific course. Exhibit 3.3 contains a list of questions focused on the six kinds of learning in this taxonomy. The suggestion is that you answer each question, or at least the most important question within each set, for the course you are working on.

To illustrate what the answers might look like, I have shared the responses of three professors—in art history, psychology, and microbiology—I interviewed concerning their learning goals. Their answers are shown in Exhibit 3.4. Notice the lead-in question for this exhibit. By framing the question in terms of what you want to be true about students a year or so after the course is over, you focus on the lasting impact of the course on students. Asking the question this way keeps you from describing what are in fact learning activities to be used during the course rather than the desired outcomes of these activities.

The other important feature of the learning goals shown in Exhibit 3.4 is the verb that begins each statement. It is important to formulate goals that start with verbs, to indicate what it is you actually want students to do in the future. But it is also important for these verbs to be as concrete and as specific as possible. Pushing yourself to find and use such verbs will clarify for you and your students what it is

EXHIBIT 3.3. QUESTIONS FOR FORMULATING SIGNIFICANT LEARNING GOALS.

What impact do I want this course experience to have on students, that will still be there a year or more after the course is over?

FOUNDATIONAL KNOWLEDGE

- What key *information* (facts, terms, formula, concepts, relationships. . . .) is important for students to *understand and remember* in the future?
- What key *ideas* or perspectives are important for students to understand in this course?

APPLICATION

- What kinds of *thinking* are important for students to learn here:
  - *Critical thinking,* in which students analyze and evaluate?
  - *Creative thinking,* in which students imagine and create?
  - *Practical thinking,* in which students solve problems and make decisions?
- What important *skills* do students need to learn?
- What *complex projects* do students need to learn how to manage?

INTEGRATION

- What *connections* (similarities and interactions) should students recognize and make. . .
  - Among ideas *within* this course?
  - Between the information, ideas, and perspectives in this course and those in other courses or areas?
  - Between material in this course and the students' own personal, social, and work life?

HUMAN DIMENSION

- What can or should students learn about *themselves?*
- What can or should students learn about understanding and interacting with *others?*

CARING

- What changes would you like to see, in what students *care* about, that is, any changes in their. . .
  - Feelings?
  - Interests?
  - Values?

LEARNING HOW TO LEARN

- What would you like for students to learn about. . .
  - *How to be a good student* in a course like this?
  - *How to engage in inquiry and construct knowledge* with this subject matter?
  - *How to become a self-directing learner* relative to this subject? That is, have a *learning agenda* of what else they need and want to learn and a *plan* for learning it.

EXHIBIT 3.4. SIGNIFICANT LEARNING GOALS FOR THREE COURSES.

A year after this course is over, I want and hope that students will . . .

Kinds of Learning	Microbiology	Art History	Psychology (Statistics)
Foundational knowledge	. . . remember the terms associated with microbial anatomy, biochemistry, and disease. . . . understand *orders of magnitude*, that is, what exists at different levels or scales, in relation to other objects. . . . remember the primary categories of organisms.	. . . remember some of the main stylistic categories (for example, prehistoric, medieval), artists, times and chronology, and locations of major works of art in world civilization. . . . be able to identify the key elements of design in any work of art.	. . . remember the meaning of terms related to population and parameter, sample and statistics. . . . understand the meaning of two key concepts: variance and correlation; and remember the formula for calculating variance. . . . understand that relations inside numerical systems mean things, that is, map into the real world.
Application	. . . be able to critically evaluate bodies of literature in academic and popular outlets. (Critical thinking.) . . . be able to mathematically calculate the rate and extent of microbial growth. (Skill.)	. . . be able to do a formal analysis of pictures when they visit an exhibition in an art museum in terms of the main elements of design. (Analytical thinking.) . . . identify the era or style (and likely artist) when encountering a new picture for the first time and interpret the likely symbolic meaning of the content. (Analytic thinking.)	. . . be able to look at a graph and see relationships in the real world that are being described. (Skill) . . . be able to engage in quantitative reasoning, that is, construct a distribution of quantitative information. (Creative thinking) . . . become critically sensitive to the size of things, that is, able to evaluate the significance of the size of something in terms of appropriate contextual information. (Critical thinking)
Integration	. . . integrate ideas about energy from chemistry and microbiology. . . . relate ideas about microbial biology to processes in higher organizations, for example, metabolism, disease.	. . . identify particular ways in which the art forms of various times and places in history reflect the milieu (social, religious, economic, political, and so on) of those times and places.	. . . connect numerical systems of statistics with the widespread use of numbers in the students' everyday personal and public life. . . . relate statistical procedures to quantitative reasoning that goes on

		. . . identify some of the similarities between the styles of different art forms (for example, painting, sculpture, architecture, and so on) in a given time and place . . . identify some of the similarities between the art forms of different places at the same time.	in all other courses, including the humanities (for example, visual perspective in art). . . . identify the differences and relationship between the two central concepts of variance and correlation (for example, I can measure the variance of IQ within this class, and then I can measure the correlation between IQ and course grades).
Human dimension	. . . come to see themselves as people who are more educated about microbiology than the average layperson. . . . be able to inform and educate other intelligent citizens about the role of microbiology in personal and public life, for example, educate their roommates about proper ways of cooking hamburger.	. . . become more sensitive to and aware of how a learner's day-to-day aesthetic environment reflects various artistic styles and periods and how these different environments affect the learner. . . . become more aware of how different people (from various cultures, places, and times) create different kinds of aesthetic environments and the reasons for that. . . . become more aware of and interact with the efforts of others as they try to make residential, work, and public places more aesthetic.	. . . become more confident about their ability to learn this material and be less intimidated by it. (Self) . . . come to see themselves as having their own special way of learning, use that to their advantage, and not have to worry about whether they are better or worse than other learners. (Self and Others)
Caring	. . . be excited about microbiology as a broad, complex, multifaceted field of study, that is, a subject that is concerned with more about organisms than just their role as causes of human diseases. . . . value the importance of precise language in this field of work, as part of professionalism.	. . . be more interested in attending art exhibits. . . . consider collecting some nice works of art for their own homes. . . . be interested in searching out how different countries and different people create urban environments and how they decorate their environments.	. . . find that learning about quantitative reasoning is fun. . . . be anxious to critically evaluate the quantitative material that they encounter regularly in the public media.

EXHIBIT 3.4. SIGNIFICANT LEARNING GOALS FOR THREE COURSES, Cont'd.

A year after this course is over, I want and hope that students will . .

Kinds of Learning	Microbiology	Art History	Psychology (Statistics)
Caring *(continued)*		. . . take time to try to understand what prompts various art styles and periods, whether they intuitively like it or not.	
Learning How to Learn	. . . be able to know how to read assigned material responsibly. (Being an effective student.) . . . know how the scientific method works, especially the importance of identifying and testing the hypothesis. (A method of learning that is particular to this subject matter.) . . . be able to identify important resources for their own subsequent learning. (Being a self-directing learner.)	. . . know how to continue building a fuller understanding of the art of a particular style or period. . . . be able to identify some of the major locations of artworks and exhibits in the local community and region. . . . be able to identify several resources (movies, TV, books, magazines, computer programs) available to help them continue learning about art in different times and places. . . . have a fairly clear sense of what they would like to learn next about art and art history.	. . . have learned about their own preferred learning style and use it in the future. . . . understand the need for multiple exposures to material in order to develop a solid understanding of it, for example, listen to lecture, review notes, read text. . . . continue to be proactive with data collecting and data analysis in their own lives, for example, able to calculate mortgage rates to determine whether to refinance a mortgage or make early payments.

you really want in terms of student learning. To help with this process, Exhibit 3.5 lists some verbs that would be appropriate for each type of significant learning.

As you formulate your learning goals, consider these tips on how to approach each kind of significant learning:

Foundational Knowledge. The key here is to limit yourself to identifying only what is really important for students to have in long-term memory one to three years later. Of course, we would all like all our students to remember everything. In reality, however, "everything" is not extremely important—but some things are. Notice

EXHIBIT 3.5. VERBS FOR SIGNIFICANT LEARNING GOALS.

Foundational Knowledge:		
Remember	Understand	Identify
Application:		
Use	Judge	Calculate
Critique	Do [skill]	Create
Manage	Imagine	Coordinate
Solve	Analyze	Make decisions about . . .
Assess		
Integration:		
Connect	Relate	Integrate
Identify the interaction between . . .	Compare	Identify the similarities between . . .
Human Dimension:		
Come to see themselves as . . .	Understand others in terms of . . .	Decide to become . . .
Interact with others regarding . . .		
Caring:		
Get excited about . . .	Be more interested in . . .	Value . . .
Be ready to . . .		
Learning How to Learn:		
Read and study effectively . . .	Identify sources of information on . . .	Frame useful questions
Set a learning agenda	Be able to construct knowledge about . . .	Create a learning plan . . .

how the microbiology professor, after thinking about it, limited the list to *certain* terms, the *concept* of orders of magnitude, and the *primary* categories of organisms, not all categories and subcategories. The course may well introduce all categories, but the professor would be satisfied if some years later the students at least remember the primary categories.

Application. This is where thinking skills and other skills come in. Ask yourself: What is it you want students to be able to *do* in relation to this subject, one to three years after the course is over? What situations are students likely to be in, where the learning from this course will be relevant? In those situations, what would you like them to be able to do: critically evaluate something, analyze something, or create, design, or calculate something?

Integration. The main point with integration is to think about what kind of connections you want students to make. Do you want them to connect the course material to their everyday life (like the psychology professor did), to other realms of study (like the art history professor), or to other closely related subjects of study (like the microbiology professor)? These are all valid forms of integration, but each teacher has to decide what kinds of integration are important when studying a given subject.

Human Dimension. This kind of learning has two closely related components: learning about oneself and about others. For the first component, ask yourself whether you would like the students to see themselves in some new way. For example, you might want students to see themselves as being more educated about an important topic and hence carrying a new responsibility for social leadership on that topic. For the second component, ask whether you want your students to gain a new understanding of how to interact with other people in relationship to this subject. They can interact, for example, with other students, experts in the field, future colleagues, or whatever. When a teacher accepts this kind of learning goal, it means students will do more than learn *about* the theory and content of a field; they will learn how the theories and content can affect their own lives and their interactions with others.

Caring. Most professors want their students to gain an increased appreciation for the subject being studied, that is, to value it more highly than before. To the degree that this is true, this should be one of the explicit goals for the course. Sometimes subjects entail additional specific values that are desirable to promote, such as valuing the importance of precise language (like the microbiology course) or attending art exhibits (like the art history course).

Learning How to Learn. This kind of learning is more complex because it has three distinct forms: becoming a better student, learning how to inquire about this particular subject matter, and becoming a self-directing learner. If one is selective and focused, it is possible to imagine a course addressing all three in one way or another, as the statements by the microbiology professor imply. The other two examples, though, also show some of the varied and rich forms this kind of learning can take.

Two Tips for Selecting Learning Goals. In addition to using the language of significant learning to shape your learning goals, I would offer two other suggestions.

Include As Many Kinds of Significant Learning As Possible. In Chapter Two I mentioned that the taxonomy of significant learning was interactive in nature. One implication of this is that the more of the six kinds of significant learning you can include as goals for your course and really support, the better each kind of learning will happen. If you can design five or six such goals into the course, each of those will happen more fully and more effectively for your students than if you only include one or two.

That may sound like magic or hocus pocus, but it is not. Excellent teachers are already demonstrating this principle in their teaching. The secret is learning how to be creative in developing and incorporating powerful learning activities that allow students to become more aware of what they are learning and how it all relates. I'll say more in Chapter Five about specific teaching and learning activities and feedback and assessment procedures that result in a powerful learning experience for students. But for the moment, I am only making the point that "more is better" when it comes to formulating learning goals.

Link Your Learning Goals to Your Own Dreams. In the first chapter of this book I noted that essentially all faculty have rich and exciting dreams for their teaching, even though these dreams are sometimes buried deep beneath the challenges and difficulties of everyday teaching. However, when you formulate the learning goals for your courses, this is a good time to put yourself in touch with your own deep dreams and to let these inform and shape the goals for your courses. If you want students to learn how to "make a difference in the world," "fight for social justice," "become creative writers," or "find a lifelong joy in continued learning" about your subject, you need to translate those dreams into explicit goals for the courses you teach. The language of significant learning is capable of helping you do that in a controlled and focused way, but also in a way that enables you to dream as fully and as richly as you possibly can.

Step #3: Formulate Feedback and Assessment Procedures

The third component of a course that a teacher must design is feedback and assessment. For many teachers, this has meant little more than giving the traditional "two midterms and a final." And that involves the one task that many teachers find to be the most distasteful part of teaching: grading. Teachers often lament: "If I could only teach and not have to grade, it would be so much more fun." Similarly, students often feel the same way: "Taking a course isn't so bad, but gearing up for those exams is a real pain."

Steps in Integrated Course Design

Initial Phase: Building Components Parts
1. Situational Factors
2. Learning Goals
3. **Feedback & Assessment**
4. Teaching & Learning Activities
5. Integrate the Component Parts

Intermediate Phase: Coherent Whole
6. Course Structure
7. Teaching Strategy
8. Overall Set of Learning Activities

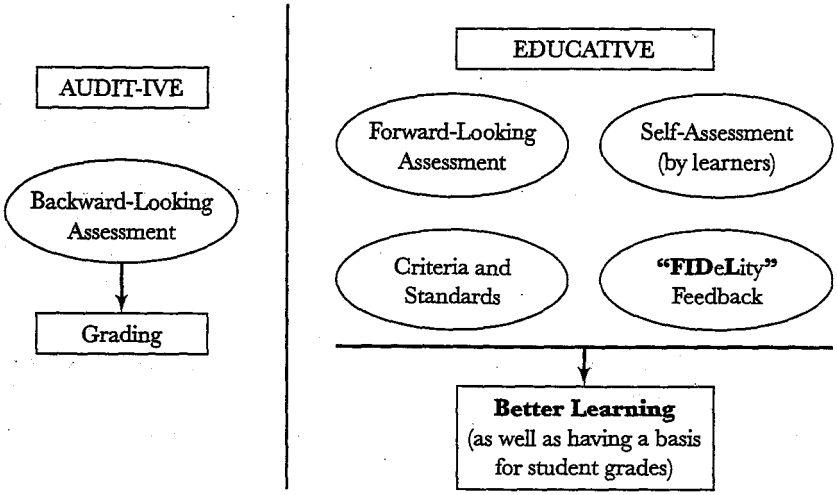
Final Phase: Four Remaining Tasks
9. Grading System
10. Possible Problems
11. Write Syllabus
12. Evaluation of Course and Teaching

What is the reason for this? Can anything be done about it? And what does this have to do with instructional design? There are several reasons why the taking and grading of exams is so onerous for both parties, but one of the main reasons is that many teachers have a very limited view of the nature of feedback and assessment. Much as teachers need to expand their view of learning goals to include more significant learning, they also need to expand their view of feedback and assessment to include more *educative* assessment.

Much of what follows is similar to the general message of two publications that have much to offer on this topic: *Effective Grading* (Walvoord and Anderson, 1998), and *Educative Assessment* (Wiggins, 1998). I have made my own interpretation of their ideas, but their ideas and mine are all aimed at the same goal: formulating grading and assessment procedures that support learning rather than hinder it.

"Audit-ive" Versus Educative Assessment. Grant Wiggins (1998) has generated a concept that is extremely important here. He distinguishes between "audit-ive" and educative assessment (see Figure 3.5 for my illustration of the meaning of these two concepts). Teachers whose only feedback and assessment procedures are two midterms and a final exemplify the perspective of audit-ive assessment. When this is the only feedback and assessment that occurs in a course, it serves only one function: to audit student learning as a basis for the grade turned in. This approach to feedback and assessment is typically based on backward-looking assessment, with exams that look back on what was covered during the last several weeks and aim simply at determining whether the students got it or not.

FIGURE 3.5. AUDIT-IVE AND EDUCATIVE ASSESSMENT.



In contrast, the primary purpose of educative assessment is to help students learn better. As long as society requires grades, teachers will need a valid and fair basis for their grades. The problem is that teachers do not know how to go beyond grading to being able to provide the kind of feedback and assessment that will enhance the learning process itself, that is, to do more than simply record the results of the learning process. Teachers need to learn what educative assessment is and how to incorporate it into their teaching.

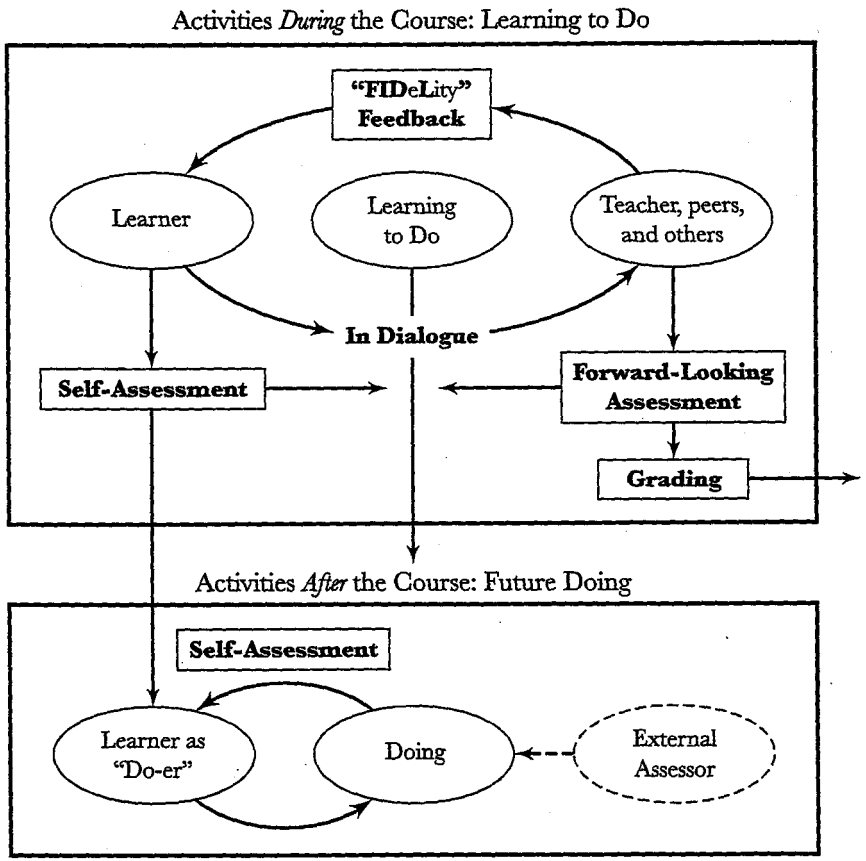
As indicated in Figure 3.5, educative assessment has four primary components: forward-looking assessment, criteria and standards, self-assessment, and "FIDeLity" feedback. ("FIDeLity" feedback is my own addition to the concept of educative assessment. This acronym refers to feedback that is Frequent, Immediate, and Discriminating (based on clear criteria and standards), and delivered Lovingly. (This kind of feedback is described more thoroughly later in this chapter.) If teachers can learn how to develop procedures for each of these four components, they will give themselves and their students a much clearer understanding of the degree to which the students are learning something correctly. That in turn will enable students to start the process of monitoring and evaluating their own learning, a key step if they are ever to become self-directing learners.

Looking at how these four components operate in and beyond a course will help indicate both their relationship to each other and their significance for high-quality student learning. An expanded model of educative assessment is shown in

Figure 3.6. The top box indicates what happens during a course, and the bottom box indicates what happens after a student has finished the course and is engaging in whatever activity the course was intended to support and enhance.

During the course (top box), learners engage in some kind of learning activity in an effort to learn how to do something: read and interpret novels, design scientific experiments, use sociological theories to explain aspects of human behavior, or whatever. While the students are learning how to engage in the relevant activity, they should each be getting feedback to help them understand whether they are doing it well or not. This feedback usually comes from the teacher, but

FIGURE 3.6. EDUCATIVE ASSESSMENT (EXPANDED MODEL).



good teachers find ways to generate feedback from other students and occasionally even from an outside expert brought in for that purpose.

The diagram indicates that feedback needs to be done in dialogue. Whereas the results of *assessment* can simply be announced, the intended purpose of *feedback* requires a back-and-forth dialogue between those giving the feedback and those receiving it. When I tell a student, for example, that an experimental design needs some "control variables" added to it, I need some response from the student in order to know whether my message has made sense. That is why feedback needs to be done in dialogue.

After the students have practiced learning to do something for a while, their individual ability to perform high-quality work will need to be assessed. The teacher, or sometimes an outside expert, will need to conduct some form of assessment. This is also necessary to provide a basis for the grades that most institutions require for purposes external to the course. But in addition, the learners also need to engage in self-assessment. This too will take practice because the criteria and standards relevant to this particular activity will be new to the students, who will need time and practice to learn how to apply these standards to their own work.

Why is it so important for students to learn how to assess their own work and activities? Because after the course is over (bottom box of Figure 3.6), the teacher will no longer be present, and the learners will henceforth be the ones primarily responsible for determining whether they are doing a worthwhile job and, if not, looking for ways to improve. In some situations, especially in work settings, there may be a supervisor who in essence becomes an external assessor. But the people doing the activity will always be the ones who must be able to assess the results of their own work. And they will have difficulty engaging in self-assessment effectively at this time unless they have had practice and have learned how to do it back in the course.

Although the other component of educative assessment, criteria and standards, does not appear on this diagram, it is essential throughout the whole process. Feedback, forward-looking assessment, and self-assessment (both during and after the course)—none of these can be done properly without clear and appropriate criteria and standards.

The next few sections offer some explanation on how to implement each of the four features of educative assessment.

First Feature: Forward-Looking Assessment. When a teacher creates any of the various assessment procedures that are typically used in a semester-long course (assignments, tests, and the individual questions involved), one perspective that can be very helpful is to strive for forward-looking assessment rather than backward-looking

assessment. Teachers using backward-looking assessment look back on what has been covered during the last four weeks, for example, and in essence say to the students: "We have covered topics X, Y, and Z. Did you get it?" In forward-looking assessment, teachers look ahead to what they expect or want students to be able to *do* in the future as the result of having learned about X, Y, and Z. The relevant question becomes: "Imagine yourself in a situation where people are actually using this knowledge. Can you use your knowledge of X, Y, and Z to do [this]?"

Wiggins, when writing about what is necessary to ensure authentic performance (1998, chapter 2), identifies two key elements: authentic tasks and performer-friendly feedback. These are essentially the same as what I am calling here forward-looking assessment and FIDeLity feedback respectively. He describes very convincingly why authentic tasks are so important, if we want to create testing situations that will teach and improve student learning, not just measure it. "Assessment must be anchored in and focused on authentic tasks because they supply valid direction, intellectual coherence, and motivation for the day-in and day-out work of knowledge and skill development. . . . Assessment is authentic when we anchor testing in the kind of work people do, rather than merely eliciting easy-to-score responses to simple questions" (1998, p. 21).

To create forward-looking or authentic assessment, Wiggins (1998, pp. 22, 24) recommends that teachers create questions, problems, tests, and assignments that

- *Are realistic.* The task or tasks replicate the ways in which a person's knowledge and abilities are tested in real-world situations.
- *Require judgment and innovation.* The student has to use knowledge and skills wisely and effectively to solve unstructured problems, such as when a plan must be designed, and the solution involves more than following a set routine or procedure or plugging in knowledge.
- *Ask the student to do the subject.* Instead of reciting, restating, or replicating course content and prior knowledge through demonstration, the student has to carry out exploration and work within the discipline of science, history, or any other subject.
- *Replicate or simulate the contexts in which adults are tested in the workplace, in civic life, and in personal life.* Contexts involve specific situations that have particular constraints, purposes, and audiences. Typical school tests are contextless. Students need to experience what it is like to do tasks in workplace and other real-life contexts, which tend to be messy and murky. In other words, genuine tasks require good judgment. Authentic tasks undo the ultimately harmful secrecy, silence, and absence of resources and feedback that mark excessive school testing.
- *Assess the student's ability to use a repertoire of knowledge and skill efficiently and effectively to negotiate a complex task.* Most conventional test items are isolated elements of performance—similar to sideline drills in athletics rather than to the integrated

use of skills that a game requires. Good judgment is required here, too. Although there is, of course, a place for drill tests, performance is always more than the sum of the drills.

- *Allow appropriate opportunities for students to rehearse, practice, consult resources, and get feedback on and refine performances and products.* Although there is a role for the conventional secure test that keeps questions secret and keeps resource materials from students until during the test, that testing must coexist with educative assessment if students are to improve performance.

The idea is to focus student learning on realistic and meaningful tasks through cycles of *performance-feedback-revision-new performance.* This is essential to help them learn to use information, resources, and notes in order to perform effectively in context. Rather than create questions and problems with no context, the teacher should strive to create a problem or question that has a meaningful, real, authentic context that the students might well face in the future and that allows the students to actually use recently acquired knowledge and skills.

Changing Backward-Looking Assessment to Forward-Looking Assessment. Some examples may help teachers understand how to transform backward-looking assessment activities into forward-looking assessment.

The first example comes from my own course on world geography. We studied a different world region each week and periodically had an exam either on one region or several regions. After studying a given region, an easy backward-looking option for assessment was to give students one of the following two assignments. "List three distinctive characteristics of each country in this region" or, in a multiple-choice format, "Which of the following features most accurately characterizes country 'X' in this region?" This is a content-centered approach to assessment: present some content, and then ask, in essence: "Do you understand it, and can you remember it?"

Here's a better and more forward-looking option, which I worked up after a few years of teaching this course:

> Imagine that you are working for an international company that wants to establish a commercial presence in this region. The company sells a product that requires a modest per capita income for people to purchase it. The corporate executives understand that they will not realize significant income during the first five years or so. But they want to establish a foothold in the region with hopes of financial success in the not-too-distant future.
>
> The key to success is being in a country that will have enough political stability to allow economic growth and sufficient other factors to support at least moderately high earning power among the general population.

> The company has asked you to serve on an advisory board that will recommend the country in which the company should open a new branch operation.
>
> Given what you have learned about the countries in this region, what country would you recommend as best meeting the needs of this company?

This simulation problem requires students to review the information they have studied. But the information they need was not presented in this form in the text or in class. Therefore they have to think about what kinds of information are related to political stability, economic growth, GNP, and so on. And then they have to compare information from several countries and make a "best choice" recommendation. When I used this assignment and watched the students working on it, I was impressed with the kind of thinking that occurred and with the quality of their answers. They also worked on this task in groups, and the discussion that followed when we compared answers across groups was quite stimulating. They had to learn to articulate the reasoning behind their answers in order to defend it against different recommendations from other groups.

Wiggins (1998, pp. 26–27) also presents some examples related to assessing student knowledge of basic mathematical calculations. A typical approach, which I regard as backward-looking assessment, contains a series of simple out-of-context problems, with the usual: "Here is a shape, calculate the surface area or volume." As an alternative, which I see as forward-looking assessment, Wiggins suggests asking students to imagine that they are in charge of gift wrapping in a large department store. The students are given some data about volume of sales and so on. But they need to generate some key data for themselves. The task is to identify the box shape that will require the least amount of wrapping paper and then recommend to the supervisor how many boxes and the total amount of wrapping paper that will be needed for the coming year. The assignment also provides specific criteria, another key component of educative assessment.

Exercising Versus Forward-Looking Assessment. As we strive to formulate forward-looking assessment, it is important to understand the difference between this and what can be described as *exercising.* When we introduce a particular protocol for working on a specific kind of problem, we then often give students homework problems in which they perform this protocol several times, with slightly different parameters to the problem. This kind of exercise characterizes many end-of-chapter problems. Exercising is good in that it provides practice and familiarity with how a particular mental activity works and hence is valuable in the early stages of learning. But exercising is not the same thing as forward-looking assessment. Eventually students will find more intellectual excitement and motivation if they are challenged to use their new knowledge on realistic tasks that they can relate to more effectively.

An important key to developing forward-looking assessment is for the teacher to think, "What am I trying to prepare students to do? What is it I am trying to determine that students are ready or not ready to do?" An example of an institution that has widely accepted the idea of forward-looking assessment (without calling it that) is Alverno College. Because it has an outcomes-based curriculum, it also has sophisticated assessment procedures. As a result, its student assessment procedures are typically framed in the following way: "As the result of having studied and learned about X, is the student ready to do Y?" In the Alverno Department of Education, for example, students put together a learning portfolio that is assessed by a teacher and a school principal. The whole point of the learning portfolio is to allow the assessors to answer the question, "Is this student ready to teach?" That is the proper way to conduct forward-looking assessment.

Second Feature: Criteria and Standards. All assessment is an attempt to measure the quality of something and therefore, by definition, requires an appropriate yardstick. Hence an extremely important aspect of the assessment component of course design is to have clear and appropriate criteria and standards for use in both forward-looking assessment and self-assessment. The term *rubric* is commonly used these days to describe the combination of criteria and standards for either a project or a whole course. It is extremely important for a course to have a clear and appropriate rubric because students need to know what constitutes high-quality performance in whatever activity they are trying to learn.

Although the need for clear criteria and standards would seem rather obvious, empirical studies indicate that faculty members frequently overlook this aspect of their teaching. Michael Flanigan (2000) conducted a longitudinal study of writing assignments that started with a sample of more than a hundred freshmen at a large state university. He collected every writing assignment and every returned paper they received during their next four years in college. One of the biggest problems he discovered was that, in the majority of the assignments given and in the evaluations returned to the students, the criteria and standards by which the writing was evaluated were not clear, even to Flanigan. In a separate study, Richard Paul and his associates (1997) interviewed 140 college teachers about their efforts to promote critical thinking. He found, among other things, that only a very small percentage of the teachers (8 percent) were able to identify the key criteria and standards by which they evaluate the quality of their students' thinking.

How can professors do a better job of clarifying the criteria and standards for student work? In *Effective Grading* (1998), Walvoord and Anderson examine grading as a "tool for learning and assessment." One impressive feature of this book is that it addresses a number of course design issues while starting with a focus on the topic of feedback and assessment.

One of the major contributions of these two authors is their insistence on the importance of having clear criteria and standards. In their fifth chapter, they describe a well-developed method called Primary Trait Analysis (PTA) that can be used to give students a better understanding of what the teacher wants and to help the teacher generate more meaningful feedback and assessment.

To construct a PTA scale for an individual assignment, a teacher should:

- Make sure you are clear about your objectives for the assignment.
- Identify the *criteria* or "traits" that will count in the evaluation.
- For each trait, construct a two- to five-point scale by creating descriptive statements of good and poor versions of this trait (this constitutes the *standards* for the assessment).
- Try out the scale with a sample of students or with colleagues, and revise as necessary [Walvoord and Anderson, 1998, p. 69].

To give this a more concrete meaning, the authors offered two examples. One is concerned with criteria one might find in science and the other in the humanities (pp. 81–82):

An Example from Science:

- *Criteria or Desired Trait: Hypothesis Construction*
- *Standards:*
  - 3 = *Correct* statement of problem with accompanying null and alternative hypothesis. *Good* choice of alpha level.
  - 2 = *Correct* statement of problem but does not include alternative hypothesis or alpha level.
  - 1 = Statement of problem is vague or missing, or hypothesis is *incorrect.*

An Example from the Humanities:

- *Criteria or Desired Trait: Elegance of Argument*
- *Standards:*
  - 5 = Original and clearly stated thesis; persuasive, well-organized, imaginative use of source material.
  - 4 = Clearly stated thesis, good use of sources, well organized.
  - 3 = Facts straight with a reasonable explanation of the subject under consideration.
  - 2 = Poorly stated thesis, inadequate survey of available sources, poor organization.
  - 1 = No awareness of argument or complexity.

Example of a Full Set of Criteria and Standards. To provide an example of how criteria and standards can be developed in relation to major course goals, I will describe an example of one professor I worked with in physics. He had a lab course on electronics. We spent some time identifying the main learning goals for the course and eventually formulated the following statement that focused on application learning:

BY THE END OF THIS COURSE, STUDENTS SHOULD BE ABLE TO *DESIGN, CONSTRUCT,* AND *ASSESS* ELECTRONIC APPARATUS TO MEASURE PHYSICAL PROPERTIES.

Once these three key areas of student performance had been identified, he was then able to proceed to construct the important *criteria* related to each goal, as shown in Exhibit 3.6.

Then for each of the criteria, he developed a set of four-point standards. These described different levels of quality performance for each criterion. The high (++) and low (−−) ends of his *standards* for three of the criteria are shown in Exhibit 3.7.

The process of clarifying his learning goals and then developing a clear statement of the associated criteria and standards had a powerful impact for this professor. It gave him the clarity and tools he needed for a variety of assessment tasks.

EXHIBIT 3.6. CRITERIA FOR AN ELECTRONICS LAB COURSE.

I. Design: To "design" well, students should be able to . . .
   A. Conceptualize problem
   B. Use a computer program to design
      1. Effectively
      2. Efficiently
   C. Identify the accuracy and precision needed for the measurement and available from the experiment.
II. Construct electronic measure equipment that is. . .
   A. Effective (measures properly, accurately, and only the intended property)
   B. Efficient
      1. Few wires
      2. Small amount of time to construct
   C. Robust (durable)
   D. Reliable
   E. Useful in the future
III. Analyze and Assess
   A. Determine how well the apparatus works.
   B. Determine how it can be improved.

EXHIBIT 3.7. STANDARDS FOR THREE CRITERIA IN AN ELECTRONICS LAB COURSE.

Learning Goals:

I. Design:

Criterion A: *Conceptualize the problem.*

++ Considers errors, accuracy, and precision first. Still focused on the immediate but considers improvements as an afterthought.

-- Cannot start or continue, even with a few hints. Needs everything laid out.

II. Construct:

Criterion C: *Construct a robust (durable) instrument.*

++ Reliability and durability questions are considered as part of planning process and are incorporated at each step.

-- Reliability and durability are completely beyond thinking and understanding.

III. Assess:

Criterion A: *Determine how well the apparatus works.*

++ Thinks of what is necessary for a given measurement and makes sure that data is obtained to definitely answer the question at hand if possible.

-- Does not understand or give consideration to this question.

With these tools, the students could engage in self-assessment with more focus and clarity. As for the teacher, he was able to assess student performance with more confidence and more focus.

The basic idea here is fairly straightforward. If we want assessment procedures that are good, we as teachers must make clear for ourselves and for our students what criteria we are going to use to measure student performance and what standards we have for each criterion.

Third Feature: Self-Assessment. In addition to developing forward-looking assessment procedures and clarifying our criteria and standards, a third change toward creating educative assessment is to create multiple opportunities for students to engage in self-assessment of their performance.

At some point, to be powerful performers in life as well as self-directed learners, students must learn how to assess the quality of their own work. This is important for psychological reasons, but it is also a skill that students simply have to develop. It does not happen automatically. What can a teacher do to assist students in developing their ability to assess their own performance? I see three related activities that teachers can use to support self-assessment.

Identify Relevant Criteria. First, the students need to acquire or develop an initial understanding of the relevant criteria and standards for assessing a particular kind of activity. What distinguishes high-quality from mediocre work in this area? Most of the time, students do not begin courses knowing the answer to this question, nor is it generally self-evident to a novice learner. One option is for the teacher to simply tell the students what the relevant criteria and standards are. But a better option, when it is possible, is to give students an opportunity to develop these criteria and standards themselves. This process can be initiated by having students brainstorm a list of criteria that they think might be relevant and appropriate. Then they can refine this list and develop their ability to use the criteria, first, by assessing the work of other students and then their own work.

Practice Using the Criteria on Other Students' Work. After students acquire or develop a preliminary list of relevant criteria, the next step in developing their ability to apply these criteria is to practice using them in the process of giving feedback to other students on their work. Some teachers, for example, have students read copies of other students' draft papers and give feedback. To do this, students have to have some sense of what constitutes a good paper and then apply those criteria to new papers, in this case, the papers of other students.

Practice Using the Criteria on One's Own Work. A third phase in this process occurs when students are able to apply performance criteria to their own work and make improvements based on that assessment. For this to happen, students need to perform some challenging task (for example, write an essay, give a speech, think critically about a problem) and then use relevant criteria to assess their own performance. When students can do this effectively, they have succeeded in learning how to engage in honest self-assessment. If all college graduates could do this in all or nearly all the areas they study, it would be an enormous enhancement of their adult life activities.

Three Examples of Self-Assessment Activities. One interesting example of students giving feedback to each other occurs with Post-it notes.

In one business course, several student teams are asked to be consultants for a rapidly growing day-care center that has outgrown its paper-based record-keeping system and needs a new, computer-based system for keeping records of children, attendance, payments, and so on. The teams are all instructed to make recommendations for hardware, software, and operating procedures. After working on the problem for a few class sessions, the teams put their recommendations on a large sheet of paper and then tape the sheets to the wall. After the recommendations have been posted, the teams all go around the room reading, analyzing, and

assessing the relative quality of each set of recommendations. At the end of the assessment time, each team puts a *blue* Post-it note by the set they think is best and a *yellow* Post-it note on the one about which they have a significant question. They also write the nature of their question or concern on the yellow note. After the responses have all been made, each team whose recommendations have received any yellow Post-it notes is given a chance to answer or address the questions posed by their peers. The level of attention and energy at the time the Post-it notes are posted is quite high.

In this assignment, the student teams learn how to assess one another's work quite closely. They see how different people can come up with different solutions to the same problem, and they have to ask themselves: "Which of these plans would work best? Why do I think some would be better than others?" This leads to the tacit development of criteria, which then become explicit when they write comments on the Post-it notes. The discussion that ensues when each team responds to concerns identified by other teams stimulates in-depth thinking and analysis, in this case, of what the differences are between the various hardware and software options, and how important these are for the problem at hand.

A second example comes from a teacher in one of my workshops and illustrates a way to have students assess their own work. In her course, students are asked to write a substantial end-of-semester paper that incorporates much of the subject for the semester—a standard sort of assignment. When the assignment is made, students are also given the criteria by which the papers will be evaluated, which is less common but not unheard of. But the teacher then tells the students to use those criteria to assess their own papers. When the students turn in their papers, they also indicate what grade they think their own paper deserves and why.

The teacher still reads the papers and does her own preliminary evaluation. If the student's self-declared grade is within one level of the grade the teacher would give (on a plus-minus scale), the student's grade is the one that goes in the grade book. If the difference is more than one level, the student must come in for an appointment and talk with the teacher about why the self-declared grade was as high or as low as it was. At this time the teacher shares her view of the paper. The student then goes home, reassesses the paper, and turns in a new grade and justification; sometimes this is a higher grade and sometimes a lower grade.

This is a good example of students' going beyond the assessment of other students' work to being able to apply such criteria to their own work. This is what eventually needs to happen if they are to become self-assessing people in their adult life.

The third example is a particularly ingenious approach to self-assessment that involves the development of critical thinking.

Richard Paul (1996), who offers national and regional workshops on how to teach critical thinking, also teaches his own course tifled "Critical Thinking." As a final project in that course, he has students write a statement assessing how well they have learned to engage in critical thinking by the end of the course. He notes the pressure this creates for doing an honest self-assessment. A well-thought-out paper in which the student argues "I only did a mediocre job of learning to think critically" will receive a high grade and therefore will probably raise the student's course grade. On the other hand, a paper that tries to argue "I did a great job of learning to think critically" but is unable to provide persuasive evidence for that point will receive a low grade and therefore will probably lower the student's course grade. Paul has created an assessment situation in which it very clearly pays for the student to do a good job of critical self-assessment and to be absolutely honest.

Fourth Feature: "FIDeLity" Feedback. Feedback occurs whenever teachers, fellow students, or even people from outside the course look at a student's performance and give the student an evaluation of it. Like assessment, feedback is inherently evaluative; that is, it presents information about what is good about the work and what could be improved, but it also helps the learner find ways to improve it. In this sense, it puts the feedback provider in the role of a coach.

There are two important differences, though, between feedback and assessment. The first is that feedback does not become part of the course grade; only assessment does that. Second, feedback is done in dialogue with the learner, whereas assessment is announced to the learner. The result of the assessment, for example, might be: "You got a 75." (Or a "C," depending on the symbols being used). To provide feedback, the teacher needs to share an evaluation of the student's work, find out what the student thought of the work and what criteria the student was using, share information about the teacher's criteria and how they were applied, and so on. This dialogue is important because it allows the teacher to be sure the student understands the criteria and how they apply, and it starts the process of helping the student learn how to engage in self-assessment.

One way of characterizing the traits of high-quality feedback is with the acronym of FIDeLity. As noted earlier, this simply means that good feedback is

- *F*requent
- *I*mmediate
- *D*iscriminating (based on criteria and standards)
- Done *L*ovingly (or, supportively)

Frequent feedback occurs in every class if possible or at least every week. The students are doing something about which they get feedback, usually from either the teacher or fellow learners. The widespread practice of giving feedback only in the form of two midterms and a final is simply insufficiently frequent for high-quality learning.

Immediate feedback occurs very close in time to the learning activity itself, if possible during the same class. The problem with delayed feedback is that students cease to care about why their answer or activity was good or not. When the feedback comes a week or more after the learning activity, they just want to know, "Wha'd I get?"

Discriminating feedback distinguishes between good and poor performance in a way that is clear to the students. Just writing "OK" on a paper or project is neither informative nor discriminating. To be properly discriminating, the feedback needs to be based on clear criteria and standards, the same kind of criteria and standards that are involved in assessment. Students need to know, for example, that the criteria for a particular kind of essay include clear organization and the proper use of evidence and reasoning. Knowing that their organization was good but their use of evidence and reasoning was poor provides more discriminating and useful feedback than either "OK" or a "B" grade.

Lovingly delivered feedback is essential to get the message through. Why is this? When feedback is not done in the context of a loving, caring relationship, students are not likely to hear the desired message. Instead, they will filter the message for bare facts and think, "I need to do what this teacher is telling me, so I can get the grade I need and get out of here," rather than, "This teacher is providing me with the information I need if I want to learn and improve my ability to engage in this kind of activity, now and in the future." When there is empathy, personal understanding, and love, students are more likely to open up and internalize the multiple meanings of feedback in a fuller way. This principle is based on the psychology of feedback and assessment.

Feedback that has all these characteristics may sound attractive, but how can it be done? I will suggest some possible ways, first by looking at what we can learn from the psychology of feedback and assessment and then by examining two specific examples.

The Psychology of Feedback and Assessment

One key idea in educative assessment is that this process has multiple goals. In addition to needing procedures that give the students and teacher valid information about student performance, courses need procedures that support the student's

ability and desire to continue learning. This means teachers need to attend to the psychological effects of different ways of providing feedback and assessment. I have two suggestions on this topic.

The Need for a Scoreboard and for Applause. As a sports fan and occasional coach for my son's sports activities, I have noted the impressive motivation that sporting activities generate in people, despite the painful and universal experience that even the best teams have when they lose. What accounts for the players' continuing motivation to get better? After looking at this phenomenon and at teaching and learning situations, I have come to believe that situations with a scoreboard and applause have the elements necessary to powerfully stimulate high performance, whether that be in sports or in educational settings.

In sports, players have a scoreboard that gives them quick, reliable feedback on the quality of their performance. Basketball players know immediately whether that jump shot they have been practicing was successful this time or not. In education, this is the function of feedback based on clear criteria, frequently and fairly applied. Whether students are learning how to think critically or how to interpret a novel, they need prompt feedback and clear criteria for knowing whether they did it well or not this time.

The other important psychological factor in sports is the applause of the audience. As any coach knows, the support of a friendly audience for every successful play is very motivating and is the main reason it is a lot easier to win at home than it is on the road. In education, this is the function that can be fulfilled by other students, the teacher, or even an external assessor. When other students, the teacher, or external assessors compliment learners on their success in learning, they provide a powerful incentive to continue learning and to continue improving.

Examples of Successful Use of Scoreboards and Applause. One example of successful use of a scoreboard and applause is a music education professor who prepares students to be band directors. He described for me what he considers to be a key observation in his teaching. He set up the following learning sequence that is repeated several times during the course:

- Each student transcribes a piece of band music.
- That student then has to teach the new piece of music to an ad hoc band composed of fellow students in a series of ten-minute periods once a week.
- Each teaching session is videotaped.
- Immediately following the teaching episode, the student teacher receives verbal and written feedback from peers, TAs, and the college teacher.

- Following the videotape the student teacher also writes a self-analysis of the session in a journal: personal feelings that occurred while teaching and after watching the videotape, how well the class seemed to respond or perform, and so on.
- Before the next teaching session, the student teacher meets with the college professor for a coaching session, using the videotape and the student's self-analysis, and trying new ways of leading the rehearsal and other possible behaviors.

This professor noted a typical pattern of change in the students during this process. During the first several weeks, the student teachers try to teach their impromptu band and dutifully follow the professor's instructions. If he tells them to make their instructions to the players more succinct, they work on that. If he tells them to do some advance planning for the rehearsal session, they do that. But they only act in response to the teacher.

Then, at some point, the student teacher gets it and moves to a different level of operation. All the pieces come together—the planning, talking, directing, and the rest—and the student teacher has a noticeably more successful practice session. The feeling of success leads to a feeling of pride. Fellow students respond with comments such as, "Hey, that was a great session you did today." The college teacher acknowledges and compliments the student on the quality of the session. The success, based on clear criteria (like points on the scoreboard) plus the positive feedback from fellow students and the teacher (like applause) lead to a key change in the students: They start to care about the whole action of whatever it is they are learning to do (in this case, directing a group of band students).

From that point on, the professor reports, student teachers approach the rehearsal sessions very differently. They are composed and relaxed; they are ready to accept the role of teacher and be in charge; they start to become self-directing learners who are searching for ways to get better.

This teacher also added some interesting information about what happens to students who go through this procedure and then go on to actual school teaching situations. His observation is that, when placed in new situations, the new teachers often take one or two steps backward in their performance while they are dealing with the many unknowns in their new situation. But generally this only lasts for a short while. After this initial adjustment stage, the new teachers progress and quickly reach a level of performance that is even higher than that displayed in the preparatory phase of their development.

Another example of the effective use of a scoreboard and applause also comes from the field of music, this time from a trumpet professor. For years he had been following the usual pattern in studio lessons with individual students: listening to them play and then telling them what they need to do to get better. At one point he realized that his students had in fact learned a lot from their high school

band teachers (as well as others) and that both he and the students needed to acknowledge that. So he developed the simple but powerful idea of writing a "tribute letter." The students would each identify one or more people who had helped them learn some valuable skill, for example, good fingering, good tone, and good practice habits. Together they would then compose a letter from the college professor, thanking that person for the contributions to this student's music development.

In addition to creating extremely good public relations between the university and the public at large, this simple device had an unusual impact on both the students and the teacher. For the teacher, it shifted his focus from "What is not good in this student's playing that needs to be improved" to "What is good that can be commended?" This in turn resulted in a much more positive general relationship with the student. For the students, it developed a more positive view of themselves. The more positive tone of the interaction with the professor led them to think things like: "I have a good base of learning, and from that, I can continue to build toward an even better level of performance." This in turn created an appreciation of the people who had contributed to their own learning and—as a result of the preceding—a more positive attitude toward continued learning.

This whole cycle of a more positive interaction began with the professor looking for ways to give "applause," that is, positive feedback and not just critical feedback.

The Importance of Empathy in Feedback. Wiggins (1998), when discussing "Educative Assessment," identifies two key elements as being fundamental in generating assessment as truly educative. The first is "authentic tasks," or what I have labeled forward-looking assessment, as noted earlier. But the second key element is providing "performer-friendly feedback" (p. 21). He notes that when teachers do in fact give students challenging and authentic tasks to learn, and on which they will be assessed, students generally do not do well initially because the "bar has been set high." At this point in their learning, it is critical that they receive encouragement to do well. Then, with time, the teacher can "raise the bar" and begin to call for greater expectations. Hence an attractive sequence of feedback is to initially emphasize encouragement (that is, "performer-friendly feedback"); then as time goes on, the assessment can gradually move toward the still necessary goal of "honoring excellence," that is, still provide a valid scoreboard of high-quality performance.

Summary of Suggestions for Feedback and Assessment

This concludes our discussion of step #3 in the initial phase of designing a course: formulating good procedures for feedback and assessment. In this section I have suggested using the principles of educative assessment, that is, feedback and

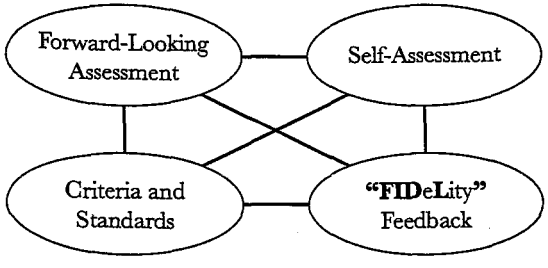
assessment procedures that enhance the quality of the learning process itself, that go well beyond simply giving the teacher a basis for issuing a grade to students.

To do this, teachers need to work on the four basic components of educative assessment:

- Create *forward-looking assessment* questions and problems.
- Develop clear and appropriate *criteria and standards* for evaluating student performance.
- Create opportunities for students to engage in *self-assessment.*
- Provide *FIDeLity feedback:* feedback that is frequent, immediate, discriminating, and done lovingly.

Figure 3.7 provides a visible summary of these components and their interrelationships.

FIGURE 3.7. FOUR BASIC COMPONENTS OF EDUCATIVE ASSESSMENT.



Review of the Course Design Process Thus Far

In this chapter I have introduced a new model of the course design process, *integrative course design,* and started the task of showing how it can help teachers design more powerful learning experiences for students. This began with the first step of analyzing the situational factors in the teaching situation, which must be done thoroughly and carefully because the results of this analysis will affect the three key decisions that have to be made. The second step focuses on the question of what the teacher wants students to get out of the course, that is, the learning goals

for the course. My recommendations are that this task be done in a way that is learning-centered rather than content-centered and that the taxonomy of significant learning be used to formulate a powerful set of learning goals. The third step is to formulate good feedback and assessment procedures. My recommendation here is to use a set of procedures known collectively as *educative assessment.* These procedures are capable of supporting and furthering the learning process itself while still providing the teacher and the learner with information about how well the student is learning.

The next step in the course design process is to develop the actual teaching and learning activities that will determine the character of the learning experience for students. And that is the beginning topic of the next chapter.

CHAPTER FOUR

DESIGNING SIGNIFICANT LEARNING EXPERIENCES II: SHAPING THE LEARNING EXPERIENCE

This chapter continues the process of designing significant learning experiences for students. Once you have carefully analyzed the situational factors, identified significant learning goals, and formulated educative feedback and assessment procedures, you have the basic components in place. But you still have some essential work left to do in the initial phase of the design process: you need to decide what teaching and learning activities to use and to make sure the main component parts of your course are properly integrated.

The second half of this chapter addresses the intermediate and final phases of the design process shown back in Exhibit 3.1 (p. 67). The intermediate phase covers the tasks of developing a differentiated course structure, selecting an effective instructional strategy, and then combining these into an overall scheme of learning activities for the whole course. The final phase completes the design process by setting up the grading system, debugging the design, writing the course syllabus, and planning an evaluation of the course.

Initial Phase, Continued

The remaining efforts in the initial phase are particularly important. To a major extent, they shape the nature and quality of the students' learning experience, so it's necessary to give them as much attention as was given to the preceding components of the course.

Step #4: Generate Teaching and Learning Activities

This fourth step is both crucial and challenging. If the preceding steps have been done well, though, you will at least be in a good position to respond to this challenge. After carefully analyzing the teaching and learning situation, identifying the learning goals, and formulating feedback and assessment procedures, you now face two questions: What will the students actually do (the learning activities) and what will you do (the teaching activities) to make significant kinds of learning happen?

Steps in Integrated Course Design

Initial Phase: Building Components Parts
1. Situational Factors
2. Learning Goals
3. Feedback & Assessment
4. **Teaching & Learning Activities**
5. Integrate the Component Parts

Intermediate Phase: Coherent Whole
6. Course Structure
7. Teaching Strategy
8. Overall Set of Learning Activities

Final Phase: Four Remaining Tasks
9. Grading System
10. Possible Problems
11. Write Syllabus
12. Evaluation of Course and Teaching

For many decades or even centuries, teachers have followed a tradition in which their teaching activity consists primarily of presenting an organized summary of their understanding of the subject (that is, lecturing) and leading occasional whole-class discussions of the subject (sometimes euphemistically called Socratic dialogue), using questions intended to both intrigue the students and reveal new aspects of the subject. This tradition creates the kind of learning experience for students that primarily consists of listening to and taking notes on lectures and participating in class discussions with one's own thoughts and very occasionally an original question.

In the last decade or so this tradition has been seriously challenged by the concept of active learning. The research literature on college teaching has raised serious questions about the effectiveness and adequacy of the lecture-discussion tradition and has suggested that students will learn more and will retain that learning longer if more active methods of teaching and learning are used (Bonwell and Eison, 1991; Bonwell, 1992–93; Meyers and Jones, 1993; Bean, 1996; Sutherland and Bonwell, 1996).

What do we mean by the concept of active learning? In the publication that crystallized this concept, Bonwell and Eison offered a straightforward definition of *active learning* as "anything that involves students in doing things and thinking about the things they are doing" (1991, p. 2). While that definition still seems on target, I would like to expand it slightly and conceptually reorganize it in a way that will allow teachers to do four important tasks:

- Analyze what is valuable in both traditional and contemporary ideas about teaching.

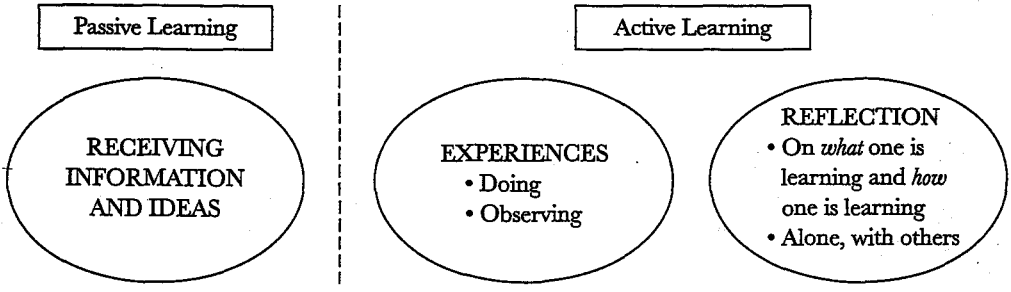
- Identify the key activities that allow effective teachers to be effective.
- Generate appropriate teaching and learning activities for a given subject that are consistent with the principles of active learning.
- Reveal the synergistic interdependence among the three components of active learning.

As teachers search for ways of moving beyond the lecture-discussion tradition, what ideas are available to guide this effort? Figure 4.1 shows a basic model of passive and active learning. This diagram is based somewhat on the definition of active learning given by Bonwell and Eison, but it also expands that definition somewhat. What they call "doing things" is referred to here as "experiences," and I simply note the importance of recognizing two basic kinds of experience: doing and observing. What they describe as having students "thinking about the things they are doing" is here termed "reflection."

Explanation of the Components. I will comment briefly on each of the three components of Figure 4.1 and then begin the process of expanding and reorganizing the idea of active learning.

Receiving Information and Ideas. Passive learning refers to what happens for students when they listen to a lecture or read a book: they receive information and ideas. This is an important part of learning, but by itself, it is very limited and limiting. When teachers see their job as being primarily to cover the material, this results in students' spending many hours of class time listening to "teacher talk." Although it is true that intellectually mature students can and will do their own reflection and make connections, this is an optional activity, not one the teacher has built into

FIGURE 4.1. PASSIVE AND ACTIVE LEARNING.



the learning experience. To get beyond "teacher talk" and add more power to the learning experience, we need to incorporate more active modes of learning into the design of the course experience.

"Doing" Experiences. "Doing" refers to any learning activity where the learners actually do that which we want them to learn how to do: design a reservoir dam (engineering), conduct a high school band (music education), design and conduct an experiment (natural and social sciences), critique an argument or piece of writing (the humanities), investigate local historical resources (history), make an oral presentation (communication), and so on. When you think about the goals for your course, think about what it is that you want students to do with this subject after the course is over: design something, read articles critically, write essays about the subject. Whatever it is that you want students to learn how to do, that is what they need to be doing during the course.

"Observing" Experiences. "Observing" occurs whenever a learner watches or listens to someone else doing something related to what they are learning. This might be observing a teacher demonstrate something ("This is how I critique a novel"), listening to other professionals perform (musicians), or observing the phenomena being studied (natural, social, or cultural).

Observing gives learners a chance to experience the reality of the phenomena they are studying. Providing this opportunity can sometimes be challenging for a teacher, but creative teachers are always searching for effective ways to do this.

One good example of an opportunity for students to observe comes from a professor who teaches a class titled "Native American Music" for non–music majors. She takes her students on a weekend trip to observe an authentic Pow Wow. She could have taken the easy route and just played recordings or even showed video clips. But she found that when she has students go to a Pow Wow and experience it firsthand, they typically make two discoveries. First, they discover that the subject they have been studying is something real and significant. Second, they discover that the content of the course (the analytical tools, the information, and so on) allows them to meaningfully interpret and understand what they experience at the Pow Wow, that is, to make sense out of it. Hence, including a strong, direct observing experience allows students to discover the reality of the subject and the value of what they have been learning about the subject.

Reflection and the Making of Meaning. Reflection, the second major component of active learning, was part of the original definition, but Bonwell and Eison did not develop it as fully as their experiential component. When the act of reflection is linked to the human need to make meaning, the enormous significance of this activity becomes clear.

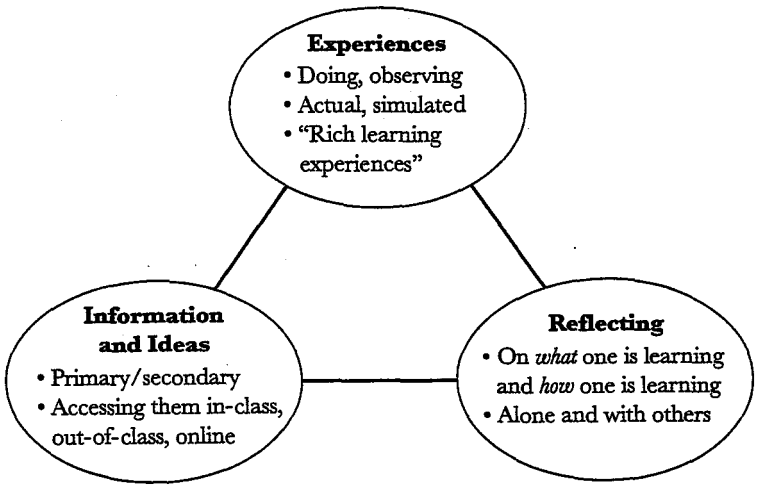
People are meaning-making beings. We make meaning based on our experiences and on the information and ideas we encounter. However, this is where a potential problem crops up. Whenever someone has a new experience or encounters a new idea, those events automatically have an initial meaning. But this initial meaning may remain buried at the unconscious or subconscious level. When this happens, the meaning may be limited, distorted, or even destructive. As humans, we have the capacity to change the meaning of our ideas and experiences—but only when we pull our original meanings up to the conscious level and reflect on what new meaning we want those ideas or experiences to have. Only then do we become *meaning-making* beings, rather than simply meaning-receiving beings. One goal in teaching is to help students to become more adept at meaning making, and that means they need to spend time reflecting on the meaning of the experiences and new ideas they acquire.

Reflection: Alone or with Others? Some portion of the meaning-making process will always need to be done by individuals who spend time reflecting alone. But most people find that making meaning entirely by themselves is not the most effective way of accomplishing this task. When we engage in dialogue with others, the possibility of finding new and richer meanings increases dramatically. In addition, when people collaboratively search for the meaning of experiences, information, and ideas, they also create the foundation for *community.* Creating a sense of community is a concept that can greatly enhance the quality of a learning experience at the level of an individual course and at the level of the whole college experience.

A Holistic View of Active Learning. These three components of active learning combine to form an enlarged and more holistic view of the topic—one that includes "getting information and ideas" as well as "experiences" and "reflection." We need a more holistic view to create the kinds of learning activities capable of achieving significant learning. Figure 4.2 illustrates this new conceptualization of active learning, one that makes all three modes of learning an integral part of a more complete set of learning activities.

This new view of active learning suggests that two principles should guide the choice of learning activities. First, an effective set of learning activities is one that includes activities from each of the three components of active learning: information and ideas, experiences, and reflection. Second, direct ways of providing these three forms of learning are preferable whenever possible. Indirect, or vicarious, forms may be necessary at times. But teachers who can find direct ways of providing active learning enhance the quality of student learning.

FIGURE 4.2. A HOLISTIC VIEW OF ACTIVE LEARNING.



Specific Activities That Promote Active Learning. Exhibit 4.1 identifies a number of specific learning activities, categorized in terms of which component of active learning they support. As indicated there, some activities engage students directly in a particular aspect of learning while others do so indirectly. This exhibit also includes ideas on how active learning might be accomplished with online instruction.

Getting Information and Ideas. It's easiest to start with the most familiar component. When a teacher has students read a textbook or listen to a series of lectures, what is happening for students? They are getting information and ideas, and they are doing this indirectly; that is, the information and ideas have been organized and interpreted by an intermediary—the textbook writer or the lecturer. Some teachers move student learning up to a direct mode of getting information and ideas by having them read original sources and examine original data, that is, ideas and data that have not yet been fully analyzed and interpreted by others.

"Doing" Experiences. As noted earlier, there are "doing" experiences and "observing" experiences, both of which are valuable. A *direct "doing" experience* consists of students' engaging in a real action in an authentic setting. For example, if a teacher wants to prepare music students to be public school band teachers, then providing

EXHIBIT 4.1. ACTIVITIES THAT PROMOTE ACTIVE LEARNING.

	Getting Information and Ideas	Experiencing		Reflecting (on *what* one is learning and *how* one is learning)
		Doing	Observing	
Direct	• Original data • Original sources	• Real doing, in authentic settings	• Direct observation of phenomena	• Classroom discussions • Term papers • In-depth reflective dialogue and writing on the learning process
Indirect, Vicarious	• Secondary data and sources • Lectures, textbooks	• Case studies • Simulations • Role-play	• Stories (can be accessed via film, literature, oral history)	
Distance Learning (online courses, interactive video, correspondence courses)	• Course Web site • Internet • Video lectures • Printed materials	• Teacher can assign students to "directly experience" . . . • Students can engage in indirect kinds of experience, at distant sites or online.		• Students can record their reflections, and then, if they choose, share their reflections with others in writing, via TV, or online.

them with an opportunity to go into a real school setting and lead the band students there, even if only for a short time, would be providing them with a direct "doing" experience. Or a teacher who wants to prepare students to use their knowledge of biology to shape public policy could have them attend and participate in a community or regional discussion of environmental issues.

Sometimes teachers are unable to provide students with direct "doing" experiences and therefore need to find or create an *indirect or vicarious "doing" experience.* Case studies, gaming, simulations, and role-playing—all are forms of learning that provide students with a vicarious form of doing. When medical schools and business schools give their students case studies, the students are practicing the doing of problem solving and decision making. When small groups work in class to solve problems in chemistry or answer questions in history, they are practicing the doing of those disciplines. When students in education or the humanities engage in role-playing, they are also translating ideas into human actions and thereby are engaging in another form of doing that is related to those fields. In each case, these indirect or vicarious forms of doing allow students the advantage of actually engaging in the kind of activity that the course is preparing them to engage in after the course is over. And the vicarious form allows them to do this without the risks and consequences that might be associated with making a learning mistake in a real situation. For example, if a business class makes a bad decision about how a company should market a new product while doing a simulation, the only result is an opportunity to learn; in real life, the consequences would be costly.

"Observing" Experiences. As with doing, students can directly observe relevant phenomena in some cases, but in other cases they may need to seek indirect observations. Some familiar examples of *direct observation* might include the following:

- Students in an art class go to a painter's studio and observe how a professional (or at least a high-quality) painter goes about the task of creating a picture.
- Students in a sociology class observe and make notes on human behavior in a crowded public place or in a family setting.
- Students in an astronomy class make nightly or weekly notes on their observation of the positions of the moon and stars.

In these situations, students are directly observing the phenomena they are trying to learn about. What they observe may be some kind of object (a painting, a human behavior, a star), or it may be the people interacting with these objects (a painter, a would-be leader in a social group, an astronomer), depending on what the teacher is trying to get students to learn about. But in either case, the students directly observe the phenomenon itself.

In other cases, students will *indirectly observe* some phenomena, generally by getting stories about the topic under study. This has the disadvantage of being indirect and thereby less full or authentic, but it also has the important advantage of significantly broadening the range of phenomena to which students have access. For example, in one of the case studies presented in the next chapter, students in a nursing class were trying to learn about cultural issues involved in childbearing. The teacher showed them a film about childbearing women in a variety of cultures, for example, Native American, Asian, and so on. These students would never have been able to directly observe and interview such women in so many different cultures. But viewing the film allowed them to acquire, indirectly—via the eyes of the filmmaker and the women who were interviewed—a wide-ranging and valuable set of observations on the meaning of childbearing in different cultures. Even as films and videotapes are able to provide students with indirect observations, literature and oral histories about the subject of a course can also provide students with stories that allow them to indirectly observe people and events (real or imagined) in times and places to which they might never have direct access.

Reflection. After students have encountered new information and ideas and had new "doing" or "observing" experiences, they need time to reflect in order to decide what meaning to give these other learning activities. Without this reflection, they have learned something but they have not made that learning fully meaningful to themselves.

Teachers commonly use two activities that encourage students to *reflect on the subject of the course:* participating in classroom discussions and writing term papers. When teachers lead a whole-class discussion about something the students have read, students are engaging in reflective dialogue about the topic at hand and what a full and proper understanding of it is. The same thing happens when a class debriefs a simulation or problem-solving activity. They have just had an experiential form of learning, and now they are reflecting on what new understanding of the subject this has given them.

A rarer but potentially even more important form of learning occurs when teachers ask students to *reflect on the learning process* itself. A teacher can ask students to keep a journal for a course or to develop a learning portfolio. In either case, students write about what they are learning, how they are learning, what role this knowledge or learning plays in their own life, and how it makes them feel. Brookfield (1995, chapter 6) has suggested that teachers have students write about critical incidents in a class and their reactions to these incidents. This is a recommendation to have students reflect on the learning process.

Three Strategies for Implementing Powerful Forms of Active Learning. To incorporate active learning into your courses in an effective way, you need to build learning activities that include all three components of active learning. You also need to make sure that each of the three components is implemented as powerfully as possible. What are some ways of doing this?

Strategy #1: Create Rich Learning Experiences. Probably the single most powerful change most teachers can make in their courses is to expand the experiential dimension of student learning. What can students do or observe that will allow them to experience the subject in a meaningful way? The best experiences are those that will support the several kinds of significant learning goals established in Step #2 of the course design process. As a result, I find the concept of *rich learning experiences* to be useful here. These are learning experiences in which students are able to simultaneously achieve multiple kinds of significant learning.

Exhibit 4.2 lists some examples of rich learning experiences that have the potential for enabling students to acquire multiple kinds of significant learning simultaneously. This means, for example, that they can learn or review the content of the course (foundational knowledge), learn how to apply and use the knowledge (application knowledge), explore the personal and social meaning of the subject (the human dimension), combine one kind of knowledge with other kinds of knowledge (integration), and so on—all at the same time.

EXHIBIT 4.2. RICH LEARNING EXPERIENCES.

What are they?

Learning experiences in which students are able to simultaneously achieve multiple kinds of significant learning.

What are some examples?

In class:

- Debates
- Role-playing
- Simulations
- Dramatizations

Outside of class:

- Service learning
- Situational observations
- Authentic projects

My own campus has three courses or programs that offer good examples of rich learning experiences. These come from engineering, business, and regional and city planning courses.

Sooner City—a simulated engineering project. An exciting curricular innovation in the engineering college is a multiyear project focused on promoting students' design skills (Kolar and others, 2000; http://www.ou.edu/idp/newsletters/archive/recent-apr00.html). Believing that engineering students need to go beyond the "plug-and-chug" experiences of learning how to calculate specific, prestructured problems, the Division of Civil Engineering and Environmental Science developed a project called "Sooner City" (using the nickname for our sports teams). Starting with freshman courses and continuing through courses in their senior year, students work on projects that add to and eventually create a place called Sooner City. In a freshman class, for example, students may design a fire station and traffic corridor, meeting specific criteria provided by the professor. Later they build a power plant, add office buildings, survey the city to lay out a street system, and so on. Each new component that is added must be integrated with what is already in place; hence the project as a whole steadily becomes more complex and more interdisciplinary.

Although the first set of students to start this project is still enrolled, it is already clear that this curricular innovation is providing students with a rich learning experience. Each of these course projects requires students to gain additional design and computer competencies, learn how to work on major projects with deadlines, how to work together in teams and make public presentations about their project proposals, how to integrate different kinds of knowledge, and so forth.

Starting and running a real business. A small group of professors in the business college also started a curricular innovation in 1995 that has been winning national awards and creating some impressive results (http://www.ou.edu/idp/newsletters/archive/recent-may.html). Called the "Integrated Business Core" (IBC), this program is a set of four courses that students take in their first semester as majors in the business college, usually as second-semester sophomores or first-semester juniors. This program includes three fundamental courses (management, marketing, and legal issues) plus a practicum course in which new companies of thirty-five students each have to start and run a real business for one semester. Within a period of sixteen weeks, the student companies have to do the following:

1. *Get started:* Decide on a product or service to provide, obtain real start-up funding, get organized, and so on.
2. *Run the business:* Actually market and sell the product.
3. *Close out the business:* At the end of the semester, the company must stop sales, close out accounts, make a report of expenses and profits, and so on.

In addition, each company must select a local community service organization with which to work. Each company employee averages more than ten hours of service with the designated community organization, and all company profits are donated to this organization at the end of the semester.

After six years and twenty-four different companies, no company yet has gone bankrupt. In the first two years, most companies realized a net profit after sixteen weeks of between $1,000 and $2,000. The later companies have obviously been learning from the experiences of earlier companies because the average net profits in the last few years have been in the $10,000–$20,000 range. In the fall of 2001, two companies set new IBC records with net profits of $35,000 and $50,000.

Student comments indicate that participants have learned many different kinds of things from this integrated package of courses. They now know *why* they need subsequent courses in the curriculum; they have learned a lot about themselves in terms of their strengths and limitations as business personnel; they have learned about the relationship between business organizations and other community institutions (banks, service organizations); and they have learned from experience about the intricacies of getting organized and keeping a focus on the delivery of a quality product or service.

Recent data from graduating seniors indicate that over 50 percent of the seniors who went through the IBC program select this as the most significant learning experience they had during their entire time in the business college. Students have to use ideas at the same time they are learning about them; hence they clearly see the relationship between theory and practice. They have to engage with ideas as well as with other students, and they are required to engage in an activity they have never done before but can recognize that they will be doing in the future. This is powerful testimony to the impact of a well-coordinated, rich "doing" experience; it works year after year, even though the students in it have had no prior formal instruction in running a business.

Redesigning the Los Angeles River. One enterprising teacher of landscape architecture had a course where he gave his class—a combination of several undergraduates and a few graduate students—the opportunity to work on a major national project (James Sipes, personal communication).

In conjunction with professional teams from other parts of the country who were working on different aspects of the project, the students had to develop and propose a plan for enhancing the river that runs through the city of Los Angeles. In Phase I of the project, they learned how to use the Internet and other resources to obtain extensive information about Los Angeles, the river in its current form and use (or nonuse), and the like. In Phase II, they worked in teams to develop a proposal for what the city *could* do to enhance the beauty, use, and value of the river, in essence making it a river parkway. This included creating a computerized

but realistic fly-over model of what the river would be like if such changes were made. In Phase III, these students actually went to Los Angeles for the first time and presented their proposal to the City Council. Their level of commitment became quite apparent when their whole computer program crashed the night before their meeting. They had to work until 4 A.M. to get it back up and running in time for a morning presentation to the City Council.

They did make their presentation successfully and the council bought the idea. In the fall of 1996, the citizens of Los Angeles approved a $319 million bond to fund the improvements proposed by the class!

These students, who were not a group of computer wizards before the project began, obviously learned a large amount of factual and conceptual information about urban planning. But they also learned numerous other things, all more or less simultaneously: how to apply conceptual ideas to specific problems, how to use computers to find information and to create models, how to work intensely with others, and how to meet deadlines, develop confidence in themselves, experience the exhilaration of seeing a major project through to completion (successful completion in this case), as well as how to interact effectively with new and different kinds of people (such as the L.A. City Council). This, in my view, is a classic example of a rich learning experience.

The main point of reviewing these three examples is to show that good teachers manage to find different ways of creating rich learning experiences. Some do it with real projects (IBC), others with simulated projects (Sooner City). Some use projects that are done on campus; others connect with places at some distance (the Los Angeles River Project). The common theme in these diverse examples is recognizing the need to provide students with a complex, challenging, context-rich "doing" experience that generates several kinds of learning simultaneously. The challenge this presents to all teachers is: What can I have my students do that will present them with a complex, challenging, context-rich learning experience?

Strategy #2: Find New Ways to Introduce Students to Information and Ideas. The second component of active learning pertains to the information and ideas that students need in order to understand a subject. This is basically synonymous with what teachers traditionally call the *content* of a course. At the present time the content is typically delivered by lectures and assigned textbooks. While this is a convenient method of delivery, it also has a significant limitation and a serious drawback in terms of student learning.

The limitation is that lectures and textbooks primarily expose students to secondary sources and secondary data. New learners will always need help from a teacher or book to create a context for understanding why a particular author or subject is important. But the more frequently students can experience original au-

thors themselves and encounter primary data about a subject, the sooner they will learn how to make sense out of and use primary sources in their own lives.

The drawback to lectures as a means of delivering content is that they consume an inordinate amount of a scarce and expensive resource: class time. Relying on lectures requires the university to provide a room and utilities as well as make arrangements for a content expert and all the students to come together at the same time in the same place for several successive weeks. This is a costly undertaking. If teachers can find other, less expensive ways to introduce students to the important ideas and information in a course, the expensive resource of class time can be used for rich learning experiences, activities that cannot easily be undertaken elsewhere. What are some alternative ways of doing this?

The traditional option, having students read the material, is still valid—but we need to find ways to get this done both *outside* of class and *before* class. Many teachers will quickly object that when they assign material now, students do not read it. And this is true. But when I talk to students about why this is so, many say they do not even bother to buy the text for many of their courses because they don't need it: the teacher covers the same material in class.

What we have here is a double-feedback loop. The teachers do not believe the students will read the book, so they cover the material in lectures. When the students see that the teacher is going to cover the material in class, they decide not to do the reading. Getting out of this cycle requires a three-part response by the teacher. If you make a reading assignment, do not lecture on the same material in class. Instead, do something that lets students know you will hold them accountable for the assignment—say, give a quiz—but then also set up an in-class activity in which students will be able to use the information and ideas they have read. This will give them an intrinsic reason for doing the reading. Creating a sequence of activities like this will be described in more detail later in this chapter under the topic of setting up an "instructional strategy."

A second way of introducing students to information and ideas outside of class comes via the computer. The amount of original text material and specific kinds of data available on Web sites is increasing exponentially. Many teachers are finding this to be an important source of information and ideas for their students. One zoology professor who teaches physiology has found great value in a Web site containing numerous pictures of the human liver: healthy livers, diseased livers, with photographs taken from multiple angles. In his view, this Web site gives students better visual information on this topic than they could obtain from any textbook or even from working with livers in a laboratory setting. Similarly teachers in classics departments now have access to Web sites with documents in their original language (Latin, Greek, French, Chinese), with multiple versions available to compare different editions, different translations, and so on. These represent a valuable

resource for both text material and data that students can access and read—outside of class.

If you are successful in finding ways to introduce rich learning experiences into your course (Strategy #1) and novel ways to enable students to learn the important information and ideas (Strategy #2), they will need some way to sort out all this learning and make sense of it. This is the function of the third strategy.

Strategy #3: Promote In-Depth Reflective Writing on the Learning Process. The third strategy for making teaching more powerful is related to the third component of active learning, reflection, and is focused on the special value of writing about the learning process itself.

This recommendation is based on two beliefs. The first is that writing, when viewed as a process and when done properly, has a unique ability to develop the interior life of the writer. The second belief is that the act of focusing students' attention on the learning process will make them more aware of themselves as learners and will thereby begin the process of developing their ability to create meaning in their lives. Exhibit 4.3 outlines some basic ideas about reflective writing.

I am making a distinction here between what I call substantive writing and reflective writing. By *substantive writing*, I am referring to writing that is focused on

EXHIBIT 4.3. IN-DEPTH WRITING TO FURTHER LEARNING.

For Whom?

Oneself (journaling, learning portfolios)

Others (teacher, other students, people outside class)

About What?

Substantive Writing: about the subject of the course

- What is a correct and full understanding of this concept or topic?

Reflective Writing: about the learning process

- What am I learning?
- Of what value is this?
- How did I learn best, most comfortably, with difficulty?
- What else do I need to learn?

What Forms of Reflective Writing?

One-minute papers

Weekly journal writing

Learning portfolios (end-of-course, end-of-program)

a topic and that attempts to present an organized statement about the information and ideas the writer has about that topic. The familiar practice of assigning term papers and essays has been used for centuries to engage students in substantive writing. *Reflective writing*, on the other hand, focuses on the writer's learning experience itself and attempts to identify the significance and meaning of a given learning experience, primarily for the writer. Hence it is quite acceptable in this kind of writing to address more personal issues, such as: What am I learning? Of what value is this, to me? How did I learn best, most comfortably, with difficulty? What else do I need to learn?

Both kinds of writing are valuable but for different reasons. Substantive writing allows and prompts writers to thoroughly think through their own ideas on a topic; hence the process of substantive writing itself often deepens the writer's understanding of the topic. Reflective writing has a different value, that of helping the writer become more self-conscious about learning. Becoming more aware of themselves as learners starts the process of allowing students to become self-directing and meaning-making learners.

Three forms of reflective writing are being used more and more by teachers who want to promote reflective learning. These are one-minute papers, regular journal writing, and learning portfolios.

A brief form of reflective writing: one-minute papers. Several writers (Angelo and Cross, 1993; Bean, 1996) have suggested the use of one-minute papers as a way of quickly and easily getting students to reflect on their learning and to do so in a way that is easily shared with the teacher. At the end of an individual class session or at the last class of a weekly sequence, the teacher asks students to take a piece of paper and write a short answer to a question. The question can vary but is often one of the following:

- What was the muddiest point in today's lecture?
- What was the most important idea you encountered in class this week?
- In your own words, how would you describe the relationship between topic X and Y?
- What important questions remain unanswered for you?

Students cannot respond to this assignment without in some way grappling with the question of: Well, what *was* the main point (or the muddiest point)? And to do that, they have to mentally review the whole lesson, a powerful learning activity. Initially students often give a wide range of answers in response to what the teacher thinks is a clear and straightforward question. One of the reasons for this is that students are not accustomed to doing this kind of reflective thinking nor to receiving feedback on the accuracy of their sense-making effort. But most professors also find

that if they continue asking for and responding to one-minute papers, students get much better at giving valid responses. This suggests that, with practice and appropriate feedback, students can become effective at engaging in reflective dialogue with themselves about the nature and meaning of their learning experience.

An intermediate form of reflective writing: journals, diaries, and learning logs. A more extended kind of writing comes in the form of journals, diaries, and learning logs. In general, these call for students to keep a running commentary during a whole course (or some other extended learning experience). Usually the teacher collects these periodically, reads them, makes comments on them, and returns them. Again, this kind of writing prompts students to reflect on the meaning of their learning experience. The main difference between this and the one-minute papers is that course-long journal writing allows students more opportunity to connect and build on their interpretation of the whole learning experience.

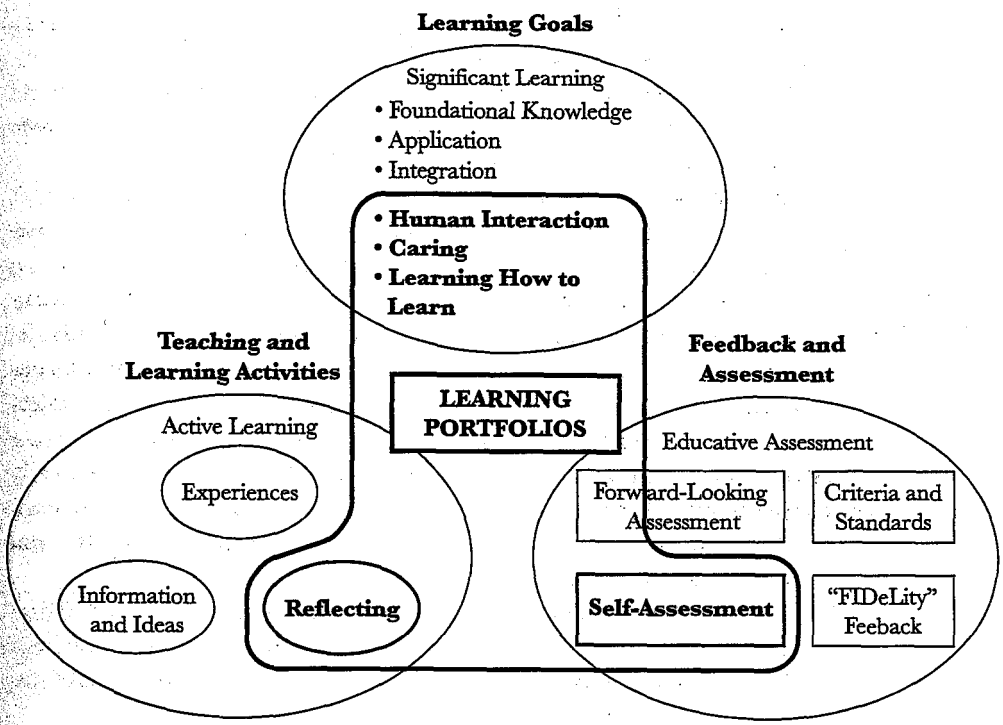
An extended form of reflective writing: learning portfolios. The concept of having students create learning portfolios is a natural extension of the idea of reflective writing. In my view, the concept of learning portfolios is one of the more powerful educational ideas to emerge in recent times. Its unusual power derives from the fact that it simultaneously integrates and promotes all three of the main components of instructional design: significant learning goals, active learning activities, and educative feedback and assessment (see Figure 4.3).

The central idea of learning portfolios is for students to reflect on a selected learning experience—which may be a single course, all the courses in their major, or their whole college experience. Then, at the end of the course or program, students put together a document that describes and illustrates the meaning of the whole learning experience. Generally the portfolio consists of two parts: a narrative statement and an appendix with various kinds of material that illustrate and support the comments in the narrative. Zubizarreta (2003) gives more detailed guidelines on what learning portfolios are and how teachers can use them.

The main point to note here is that learning portfolios can be a powerful addition to the set of learning activities in a course. They can be used alone, but they work even better when used in conjunction with the previously mentioned forms of reflective writing. If students are periodically prompted throughout the course to write one-minute papers and weekly journals, they will gradually become more comfortable with—and capable of reflecting on and writing about—the quality of their learning experience. If they do this frequently during the course, they will have a substantial collection of ideas that can be extended and organized into the form of a learning portfolio at the end of the course.

Knowing that they will be doing a learning portfolio encourages students to reflect along the way on what they can and should be learning from a particular experience, how well they are achieving the learning goals set by the institution

FIGURE 4.3. THE EDUCATIONAL VALUE OF LEARNING PORTFOLIOS.



or by themselves, and what else they need to be learning. The final product also allows students to communicate with others what they have learned and, when appropriate, can become a tool that can be used for self-assessment and institutional assessment.

Different Ways of Using Learning Portfolios. Several individuals have written about using learning portfolios in the context of a single course. Annis and Jones (1995, p. 185) describe how Jones asked students in a communication course to include two types of information in the learning portfolio:

1. A well-written statement about your ability to communicate . . .; this may take several double-spaced pages.
2. An appendix of communication samples. These should be identified by page number and referred to in the introductory statement.

The portfolios she received ranged in size from ten to fifty pages. She reports that this assignment gave credibility to the other course assignments because students continuously looked for connections to their future work and for materials to include in their portfolio. Later, she notes, "They interacted more with the subject matter, with each other, and with me. . . . The more the students saw the relationship between their course work and their career objectives, the more enthused they became about the portfolio" (p. 189).

Brookfield has written about his use of "Participant Learning Portfolios" (1995, pp. 102–106). He viewed these as a "cumulative record of a student's experience as a learner in a particular course," adding that they worked best when "students have had the opportunity to practice weekly reflection on their learning." He was careful not to grade the quality of the reported experience, only the care with which it was documented. He also had students share their portfolio entries with each other in small groups so they could see the similarities and differences in how they had experienced learning in that course. His instructions to the students were more extended than in the preceding example, but he basically asked students to look at the "critical incidents" that he had them write about each week. Then, at the end of the semester, their task was to summarize both what they learned and how they learned.

Wlodkowski (1999, pp. 260–263) has labeled what he uses a "process folio." He sees this as a powerful tool for enhancing motivation and allowing him as a teacher to respond to the interests and concerns of diverse learners. He asks students to reflect on and write about three primary considerations:

1. The *content* of the learning: What have you learned about the subject (that is, about the content of the learning experience)?
2. The *context* of the learning: How does your learning fit into the larger context of your individual life, your social/organizational life, and/or your work life?
3. The *learning process:* What have you learned about how you do learn (or how you could learn) more effectively?

This allows students to document and reflect on challenges and understandings that emerge over time.

The Taxonomy of Significant Learning as a Structuring Device. When students write in a learning portfolio about *what* they have learned in a course or program, the taxonomy of significant learning works well as a structuring device. It offers a set of questions and concepts that points students to several possible meanings that their learning experience may have for them.

One professor in a business course on my campus used this taxonomy to guide students in the development of an end-of-semester learning portfolio. To do this, he gave students the following questions to guide their reflection:

1. What *key ideas or information* have you learned about the subject of this course?
2. What have you learned about *how to use or apply* the content of the course?
3. What parts of your knowledge, thinking, or actions have you been able to *integrate* or connect within or external to this learning experience?
4. What have you learned about the *human dimension* of this subject? That is, how have *you* changed in some important way, and have you changed in your ability to interact with *others?*
5. Have any of your interests, feelings, or *values* changed as a result of this learning experience?
6. What have you learned about *how to learn?*

This framework generated a high level of awareness for the students, both about what they were learning and how they were learning it.

Effective Use of Portfolios at the College Level. Alverno College in Milwaukee, Wisconsin, has all students work on a learning portfolio throughout their entire time as undergraduates there (Alverno College Faculty, 1994). Students collect information about their own learning in reference to the eight central abilities that guide the curriculum at Alverno:

- Communication
- Analysis
- Problem solving
- Valuing in decision making
- Social interaction
- Global perspective
- Effective citizenship
- Aesthetic response

To graduate, students must, among other requirements, be able to document a certain level of proficiency on all eight abilities. Teachers, administrators, and assessors at Alverno feel that the process of creating portfolios is a very important part of their effort to create an ability-based learning experience for students and a central part of the institution's effort to monitor how well the educational program is succeeding.

Online and Distance Learning: Are They as Good as a Live Classroom? Another question about active learning relates to online and distance learning. One of the more significant changes occurring in higher education, in the United States and in a number of other countries, is the rapidly growing use of information technology. The traditional mode of distance education—correspondence courses—has been augmented by interactive TV and especially by computer-mediated forms of teaching

and learning: use of the Internet as source of course-related information, course-specific Web sites, two-way e-mail and general e-mail discussion groups for a class, and so forth.

These three forms of distance education each have their unique characteristics. Correspondence courses have a long-standing tradition and are less expensive to offer, at least as compared to the other two forms. Interactive TV adds a visual dimension to teacher-student interactions. But it is the computer-mediated form of distance education, which I see as a special form of online learning incorporating both synchronous and asynchronous interactions, that is attracting the most attention while also raising the most questions.

If one accepts active learning as a valuable principle for shaping the learning experiences of students, many people are led to ask: Can online learning be as good as learning in a live classroom? Can students really learn what they need to learn when a course is delivered completely or even partially online?

A quick but incomplete answer is that good online learning is definitely superior to poor classroom learning. But the real question is whether high-quality online learning is as good as high-quality classroom learning. In my view, the holistic model of active learning introduced in this chapter provides a conceptual framework that can be used to answer this question.

If we focus on the three components of active learning shown in Exhibit 4.1 (p. 108) and ask whether each of these can be fulfilled in a satisfactory manner with online learning, we will have a meaningful basis for deciding whether this form of learning has the potential to be a high-quality form of learning.

Access to Information and Ideas. In terms of giving students access to information and ideas, online learning is at least equal to and possibly superior to classroom teaching and learning. Anything that can be put into a textbook or even into a lecture can be put on a Web site (or CD-ROM). And simply as sources of information, Web sites have some significant advantages. They can be updated more easily and more quickly than textbooks, and they can provide high-quality text and rich illustrations—including sound as well as both still and moving pictures—available to anyone, anytime, anywhere.

Reflection. It is also relatively easy for online learning to support opportunities for student reflection. Students can record their private reflections in a file on their own computer, and they can interact electronically with other students and the professor via e-mail, discussion groups, bulletin boards, and chat rooms. Current software makes electronic dialogue a little slower and more cumbersome than live dialogue, but this is likely to improve as communication programs continue to improve. And some teachers have noted important advantages in electronic dialogue among students: students who tend to hold back in a live discussion feel freer to

contribute online, and all students have more time to compose their thoughts in an online discussion.

Experiences. The biggest challenge to online learning, in my view, will be in providing a meaningful form of course-related experiences for students. However, with a little imagination, creative teachers may be able to come up with one or both of two kinds of responses. They can assign students to engage in a *direct*, authentic "doing" or "observing" experience, outside of class, even as teachers in a live classroom currently do. Or they can find ways for students to work online with *indirect* forms of experience such as working on case studies, simulations, accessing stories, and the like. At the present time, with current levels of hardware and software, this is possible but not easy to do. However, as the quality of computer hardware and software become more sophisticated—and if enterprising teachers can find creative ways of accomplishing this component—significant progress is likely to be made.

Conclusion. Briefly, my overall assessment of online learning is that it is strong in providing information and ideas and adequate for reflective dialogue. The weak link currently is the limited ability of online learning to provide significant forms of "doing" and "observing" experiences. If and when teachers find ways to do this effectively, good online learning will clearly be comparable with learning in good classroom courses (meaning classroom courses that also provide all three components of active learning).

This assessment of the relative strength and limits of online learning is reflected in the current operation of many hybrid courses, ones that continue to meet live but for fewer hours per week while conducting a significant portion of the coursework online. These courses frequently use the online component of the course to provide students with access to the information and ideas (that is, the content) and for online discussions. Live class time is then reserved for various kinds of experiential learning, for example, working on case studies, simulations, and so forth.

Summary of Active Learning. This discussion of generating effective teaching and learning activities for a course has focused on the task of expanding the set of learning activities in use. The learning activities that have traditionally been employed in higher education are lectures, whole-class discussion, and assigned readings. To make their courses more learning centered and more powerful, teachers will need to identify and use learning activities that incorporate all three components in the holistic view of active learning, as shown in Figure 4.2.

The single biggest improvement most teachers can make is to give students more "doing" and "observing" experiences related to the subject of the course. Direct experiences are the most powerful. But when these are not feasible, indirect and vicarious forms of doing and observing are still very valuable. Teachers can